REPORT NUMBER: SPNCAP-CAL-16-004

NEW CAR ASSESSMENT PROGRAM (NCAP)
SIDE IMPACT POLE TEST

Honda MFG of Indiana, LLC
2016 Honda Civic
Four Door Sedan

NHTSA No: M20165301

PREPARED BY:
CALSPAN CORPORATION
P.O. BOX 400
BUFFALO, NEW YORK 14225

May 23, 2016

FINAL REPORT

PREPARED FOR:
U.S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
OFFICE OF CRASHWORTHINESS STANDARDS
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Prepared by: Vanessa Hansen Date: May 23, 2016
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Approved by: Edward Dutton Date: May 23, 2016
Edward Dutton, Test Engineer
Transportation Test Operations

FINAL REPORT ACCEPTANCE BY OCWS:

_____
Division Chief, New Car Assessment Program
NHTSA, Office of Crashworthiness Standards

Date: _____

_____
COTR, New Car Assessment Program
NHTSA, Office of Crashworthiness Standards

Date: _____

TECHNICAL REPORT DOCUMENTATION PAGE

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4. Title and Subtitle Final Report of New Car Assessment Program Side Impact Pole Testing of a 2016 Honda Civic four door sedan NHTSA No.: M20165301		***5. Report Date*** May 23, 2016 ***6. Performing Organization Code*** CAL
7. Author(s) Vanessa Hansen, Test Engineer Edward Dutton, Senior Test Engineer		***8. Performing Organization Report No.*** CAL-DOT-2016-004
9. Performing Organization Name and Address Calspan Corporation Transportation Test Operation P.O. Box 400 Buffalo, New York 14225		***10. Work Unit No.*** ***11. Contract or Grant No.*** DTNH22-14-D-00352
12. Sponsoring Agency Name and Address U.S. Department of Transportation National Highway Traffic Safety Administration Office of Crashworthiness Standards (NRM-110) 1200 New Jersey Ave., SE, Room W43-410 Washington, D.C. 20590		***13. Type of Report and Period Covered:*** Final Test Report, February 2, 2016 - May 23, 2016 ***14. Sponsoring Agency Code*** NRM-110
15. *Supplementary Notes*		

16. Abstract

A 32.20 km/h (20 mph), 75˚ oblique impact Side NCAP Test was conducted on the subject 2016 Honda Civic four door sedan in accordance with the specifications of the Office of Crashworthiness Standards Side NCAP Pole Laboratory Test Procedure for the generation of consumer information on vehicle side pole crash protection. This test was conducted at Calspan Corporation's Transportation Test Operations facility in Buffalo, New York on February 2, 2016.

The impact velocity of the vehicle was 32.20 km/h, and the ambient temperature at the struck (driver's) side of the target vehicle was 21°C. The target vehicle's maximum post-test static crush was 297 mm located at level 3. The test vehicle's occupant performance data is as follows:

Measurement Description	Driver ATD (SID-IIs) (Serial No. 303)		
	Units	Threshold	Result
Head Injury Criteria (HIC_{36})		1000	259.862
Resultant Lower Spine Acceleration	G	82	36.77
Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	3233.461
Maximum Thoracic Rib Deflection	mm	38	18.768
Maximum Abdomen Rib Deflection	mm	45	23.422

The two doors on the struck side of the vehicle did not separate from the body at the hinges or latches and the opposite doors did not open during the side impact event.

17. Key Words New Car Assessment Program (NCAP) Side Impact Pole Part 572V SID-IIs	***18. Distribution Statement*** Copies of this report are available from: National Highway Traffic Safety Administration Technical Information Services Division, NPO-411 1200 New Jersey Ave. SE Washington, D.C. 20590 e-mail: tis@nhtsa.dot.gov FAX: 202-493-2833

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Form DOT F1700.7 (8-72)

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SECTION 1

TEST PURPOSE AND PROCEDURE

This side impact test was conducted as part of the MY 2016 New Car Assessment Program Side Impact Test Program, sponsored by the National Highway Traffic Safety Administration (NHTSA), under Contract No. DTNH22-14-D-00352. The purpose of this test is to generate comparative side impact performance in a 2016 Honda Civic four door sedan. The side impact test was conducted in accordance with the Office of Crashworthiness Standard's Side NCAP Pole Laboratory Test Procedure, dated October 2015.

SECTION 2

SUMMARY OF TEST RESULTS

A rigid pole side impact test was conducted on a 2016 Honda Civic four door sedan. The subject vehicle was towed into the rigid pole at an angle of 75^{o} and a velocity of 32.20 km/h. The test was conducted by Calspan Corporation's Transportation Test Operations facility in Buffalo, New York on February 2, 2016. Pre-test and post-test photographs of the test vehicle and side impact dummy (SID-IIs) are included in Appendix A of this report.

One Part 572V (SID-IIs) dummy was placed in the driver designated seating position according to instructions specified in the OCWS Side NCAP Pole Laboratory Test Procedure, dated October 2015. Camera locations and other pertinent camera information are included on page 3-11 in this report.

The Part 572V (SID-IIs) dummy was instrumented accordingly:

Head CG tri-axial accelerometers
Thorax upper, middle, and lower rib displacement potentiometers
Abdomen upper and lower rib displacement potentiometers
Lower spine tri-axial accelerometers
Iliac load cell
Acetabulum load cell

Appendix B contains the dummy response data. Dummy configuration and performance verification data can be found in Appendix C of this report. Appendix D identifies all serial numbers, manufacturers, and calibration dates for test equipment, dummy sensors, potentiometers, and load cells used to collect data during the test.

Injury readings for the SID-IIs dummy were recorded as follows:

INJURY READINGS

Measurement Description	Driver ATD (SID-IIs)		
	Units	IARV	Result
Head Injury Criteria (HIC_{36})		1000	259.862
Resultant Lower Spine Acceleration	g	82	36.77
Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	3233.461
Maximum Thoracic Rib Deflection	mm	38*	18.768
Maximum Abdominal Rib Deflection	mm	45*	23.422

*****Proposed IARV

Supplemental restraint information was recorded as follows:

SUPPLEMENTAL RESTRAINT INFORMATION

Restraint Type	Left Front (Driver) Occupant Location 1		Left Rear (Passenger) Occupant Location 4	
	Mounted	Deployed	Mounted	Deployed
Frontal Airbag	Yes	Yes		
Knee Airbag	No	N/A		
Side Airbag 1 - Curtain	Yes	Yes	Yes	Yes
Side Airbag 2 – Torso/Pelvis	Yes	Yes	No	N/A
Seat Belt Pretensioner	Yes	Yes	No	N/A
Seat Belt Load Limiter	Yes	Yes	No	N/A
Other				

GENERAL COMMENTS:

1. P1 serial number – 303

Data Anomalies:

- None

SECTION 3

OCCUPANT AND VEHICLE INFORMATION

This section contains information reporting for the following Data Sheets:

Data Sheet No. 1 – General Test and Vehicle Parameter Data

Data Sheet No. 2 – Seat, Seat Belt, Steering Wheel Adjustment and Fuel Systems Data

Data Sheet No. 3 – Dummy Longitudinal Clearance Dimensions

Data Sheet No. 4 – Dummy Lateral Clearance Dimensions

Data Sheet No. 5 – Camera and instrumentation Data

Data Sheet No. 6 – Vehicle Accelerometer Data

Data Sheet No. 7 – Rigid Pole Load Cell Data

Data Sheet No. 8 – Post-Test Observations

Data Sheet No. 9 – Test Vehicle Profile Measurements

Data Sheet No. 10 – Test Vehicle Exterior Crush Measurements

Data Sheet No. 11 – Vehicle Damage Profile Distances

Data Sheet No. 12 – FMVSS No. 301 Static Rollover Results

Data Sheet No. 13 – Dummy / Vehicle Temperature and Humidity Stabilization Data

DATA SHEET NO. 1
GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2016 Honda Civic four door sedan NHTSA No.: M20165301
Test Program: NCAP Side Pole Impact Test Test Date: 2/2/2016

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA No.	M20165301
Model Year	2016
Make	Honda
Model	Civic
Body Style	Four Door Sedan
VIN	19XFC2F55GE002943
Body Color	Charcoal Gray
Odometer Reading (km/mi)	11.2 km / 7 mi
Engine Displacement (L)	2.0
Type / No. Cylinders	I4
Engine Placement	Transverse
Transmission Type	Automatic
Transmission Speeds	CVT
Overdrive	Yes
Final Drive	Front Wheel Drive
Roof Rack	No
Sunroof / T-Top	No
Running Boards	No
Tilt Steering Wheel	Yes
Power Seats	No
Anti-Lock Brakes (ABS)	Yes

Traction Control System (TCS)	Yes
Auto-Leveling System	No
Automatic Door Locks (ADL)	Yes
Power Window Auto-Reverse	No
Other Optional Feature	--
Driver Front Airbag	Yes
Driver Curtain Airbag	Yes
Driver Head/Torso Airbag	No
Driver Torso Airbag	No
Driver Torso / Pelvis Airbag	Yes
Driver Pelvis Airbag	No
Driver Knee Airbag	No
Rear Pass. Curtain Airbag	Yes
Rear Pass. Head / Torso Airbag	No
Rear Pass. Torso Airbag	No
Rear Pass. Torso / Pelvis Airbag	No
Rear Pass. Pelvis Airbag	No
Driver Seat Belt Pretensioner	Yes
Rear Pass. Seat Belt Pretensioner	No
Driver Load Limiter	Yes
Rear Pass. Load Limiter	No
Other Safety Restraint	-

Does owner's manual provide instructions to turn off automatic door locks? No

DATA FROM CERTIFICATION LABEL

Manufactured By	Honda MFG. of Indiana, LLC
Date of Manufacture	11/15
Vehicle Type	Passenger

GVWR (kg)	1695
GAWR Front (kg)	900
GAWR Rear (kg)	810

VEHICLE SEATING AND WEIGHT CAPACITY DATA

Measured Parameter	Front	Rear	Third	Total	
Designated Seating Capacity (DSC)	2	3	-	5	
Capacity Weight (VCW) (kg)				385	(A)
DSC X 68.04 kg				340.2	(B)
Cargo Weight (RCLW) (kg)				44.8	(A-B)

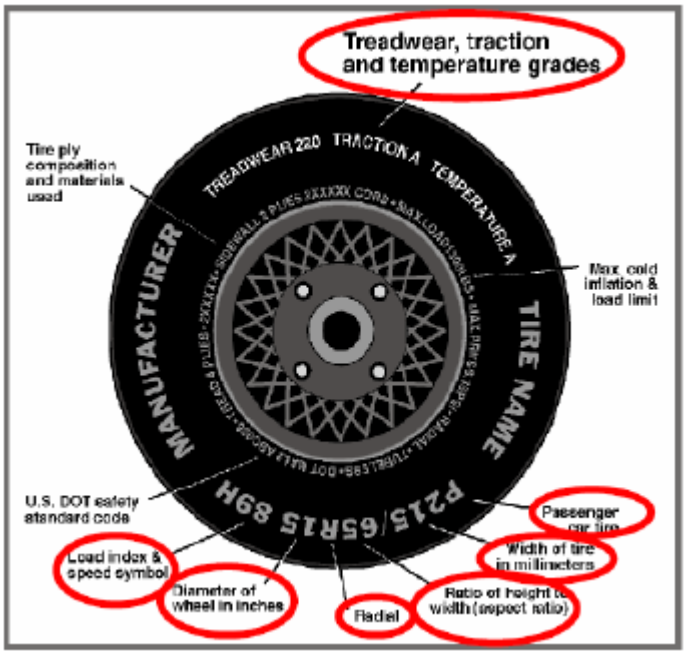
VEHICLE SEAT TYPE

Seating Location	Type of Seat Pan				Type of Seat Back		
	Bucket	Bench	Split Bench	Contoured	Fixed	Adjustable	
						W/ Lever	W/ Knob
Front Seat	X					X	
Rear or Second Row Seat		X			X		
Third Row seat							

DATA SHEET NO. 1 … (CONTINUED)
GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle:	2016 Honda Civic four door sedan	NHTSA No.:	M20165301
Test Program:	NCAP Side Pole Impact Test	Test Date:	2/2/2016

Collected for year, make, model, & VIN, all items circled in red, tire manufacturer and tire name.



VEHICLE TIRE INFORMATION

Measured Parameter	Front	Rear
Maximum Tire Pressure (kPa)	350	350
Cold Pressure (kPa)	220	220
Recommended Tire Size	P215/55R16	P215/55R16
Tire Size on Vehicle	P215/55R16	P215/55R16
Tire Manufacturer	Hankook	Hankook
Tire Model	Kinergy GT	Kinergy GT
Treadwear	500	500
Traction	A	A
Temperature Grades	A	A
Tire Plies Sidewall	2 Polyester	2 Polyester
Tire Plies Body	2 Steel, 2 Polyester, 1 Nylon	2 Steel, 2 Polyester, 1 Nylon
Load Index/Speed Symbol	98H	98H
Tire Material	Rubber	Rubber
DOT Safety Code Left	T7R11BH2815	T7R11BH2815
DOT Safety Code Right	T7R11BH2815	T7R11BH2815

DATA SHEET NO. 1 … (CONTINUED)
GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2016 Honda Civic four door sedan NHTSA No.: M20165301
Test Program: NCAP Side Pole Impact Test Test Date: 2/2/2016

TIRE PRESSURES

	Units	LF	RF	LR	RR
As Delivered	kPa	242	246	246	244
Tire Placard	kPa	220	220	220	220
Owner's Manual	kPa	220	220	220	220
As Tested	kPa	220	220	220	220

TEST VEHICLE AXLE WEIGHTS

	Units	As Delivered (UVW)			As Tested (ATW)			Fully Loaded		
		Front	Rear	Total	Front	Rear	Total	Front	Rear	Total
Left	kg	409	219		419	256		421	268	
Right	kg	354	268		379	285		360	297	
Ratio	%	61	39		60	40		58	42	
Totals	kg	763	487	1250	798	541	1339	781	565	1346

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value	
Total As Delivered Weight (UVW)	kg	1250	(A)
Actual Weight of 1 P572V (SID-IIs) ATD Used	kg	50.8	(B)
Rated Cargo / Luggage Weight (RCLW)	kg	44.8	(C)
Calculated Vehicle Target Weight (TVTW)	kg	1345.6	(A+B+C)

Does the measured As Test Vehicle Weight lie within the required weight range (i.e. Calculated Test Vehicle Target Weight – 4.5 kg to – 9 kg)? [X] **Yes** [ ] **No**

TEST VEHICLE ATTITUDES AND CG

Measurement Description	Units	As Delivered	As Tested	Fully Loaded	Meets Rqmt***
Driver Door Sill Angle (front-to-rear)*	Deg	-0.6	-0.3	-0.3	Yes
Front Passenger Sill Angle (front-to-rear)*	Deg	-0.7	-0.6	-0.5	Yes
Front Bumper-Line Angle (left-to-right)**	Deg	-0.3	-0.3	-0.3	Yes
Rear Bumper-Line Angle (left-to-right)**	Deg	-0.2	-0.2	-0.4	Yes
Vehicle CG (Aft of Front Axle)	mm	1051	1090.5	1133	
Vehicle CG (Left (+) / Right (-) from Longitudinal Centerline)	mm	3.5	6.0	18.5	

* ND = Nose Down (-), NU = Nose Up (+)
** LD = Left Down (-), LU = Left Up (+)
*** The "As Tested" vehicle attitude measurements must be equal to or between the "As Delivered" and "Fully Loaded" vehicle attitude measurements. Indicate "Yes" or "No" for Meets Requirement"

DATA SHEET NO. 1 … (CONTINUED)
GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle:	2016 Honda Civic four door sedan	NHTSA No.:	M20165301
Test Program:	NCAP Side Pole Impact Test	Test Date:	2/2/2016

WEIGHT OF BALLAST AND VEHICLE COMPONENTS REMOVED TO MEET TVTW

Component Description	Weight (kg)
Trunk Carpeting	3
Spare Tire	11
Jack	2
Rear Speaker	1
Tail Light	2
Rear Fascia	5
Hub caps	2
Non struck side windows	8
Side View Mirrors	1
Ballast / Equipment Added	0

Test Height – Adjustable Suspension Setting, if Applicable	N/A

DATA SHEET NO. 2
SEAT, SEAT BELT, STEERING WHEEL ADJUSTMENT AND FUEL SYSTEMS DATA

Test Vehicle:	2016 Honda Civic four door sedan	NHTSA No.:	M20165301
Test Program:	NCAP Side Pole Impact Test	Test Date:	2/2/2016

SEAT POSITIONING

The driver's seat, front center seat (if applicable), and right front passenger's seat should be set to the forward-most, mid-height, mid-angle position. The struck-side rear passenger's seat, rear center seat, and non-struck side rear passenger's seats should be set to the rear-most, lowest, mid-angle position.

SCRL ANGLE RANGE

Seat	SCRL (º)		
	Max	Min	Mid
Driver Seat	17.3	12.1	14.7
Front Passenger Seat	Not Adjustable		
Front Center Seat	N/A	N/A	N/A
Struck Side Rear Seat	Fixed	Fixed	Fixed
Non-Struck Side Rear Seat	Fixed	Fixed	Fixed
Rear Center Seat	Fixed	Fixed	Fixed

SEAT HEIGHT AND ANGLE

Seat	As Tested SCRL Angle (Mid) (º)	As Tested SCRP Height (mm)	SCRP Height Position	SCRP Height (mm)		
				Rearmost	Mid-Fore / Aft	Forward-Most
Driver Seat	14.7	45	Max	45	56	68
			Mid	22	33	45
			Min	0	10	21
Front Passenger Seat	Not Adjustable		Max	-	-	-
			Mid	-	-	-
			Min	-	-	-
Front Center Seat	N/A	N/A	Max	-	-	-
			Mid	-	-	-
			Min	-	-	-
Struck Side Rear Seat	Fixed	Fixed	Max	-	-	-
			Mid	-	-	-
			Min	-	-	-
Non-Struck Side Rear Seat	Fixed	Fixed	Max	-	-	-
			Mid	-	-	-
			Min	-	-	-
Rear Center Seat	Fixed	Fixed	Max	-	-	-
			Mid	-	-	-
			Min	-	-	-

DATA SHEET NO. 2 … (CONTINUED)
SEAT, SEAT BELT, STEERING WHEEL ADJUSTMENT AND FUEL SYSTEMS DATA

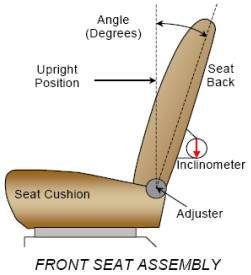
Test Vehicle: 2016 Honda Civic four door sedan NHTSA No.: M20165301
Test Program: NCAP Side Pole Impact Test Test Date: 2/2/2016

SEAT FORE / AFT POSITION

Seat	Total Fore / Aft Travel		Test Position from Forwardmost Position	
	mm	Detents*	mm	Detents*
Driver Seat	240	25	0	0
Front Passenger Seat	240	25	0	0
Front Center Seat	N/A	N/A	N/A	N/A
Struck Side Rear Seat	FIXED	FIXED	FIXED	FIXED
Non-Struck Side Rear Seat	FIXED	FIXED	FIXED	FIXED
Rear Center Seat	FIXED	FIXED	FIXED	FIXED

SEAT BACK ANGLE ADJUSTMENT

The driver's seat back is positioned such that the dummy's head is level. The front center and front passenger's seat backs are positioned in a similar manner as the driver's seat back. The struck-side rear passenger seat back is positioned in accordance with the information provided by the manufacturer on Form No. 1 for the 5th percentile female dummy in a Side NCAP MDB test. The rear center and non-struck side rear passenger's seat back are set to match the struck-side rear seat back.



FRONT SEAT ASSEMBLY

Seat	Total Seat Back Angle Range		Test Position from Most Upright	
	Degrees	Detents*	Degrees	Detents*
Driver Seat w/Seated Dummy	-5.6 to 53.7	N/A	-5.5	N/A
Front Passenger Seat	-5.3 to 54.8	N/A	-5.2	N/A
Front Center Seat	N/A	N/A	N/A	N/A
Struck Side Rear Seat	FIXED	FIXED	FIXED	FIXED
Non-Struck Side Rear Seat	FIXED	FIXED	FIXED	FIXED
Rear Center Seat	FIXED	FIXED	FIXED	FIXED

SEAT BELT ANCHORAGE ADJUSTMENT

Seat belt anchorages are adjusted in accordance with the information provided by the manufacturer on Form No. 1. Zero is defined as the uppermost detent

Seat	Total # of Positions	Placed in Position #
Driver Seat	4	0 - Uppermost

HEAD RESTRAINT ADJUSTMENT

The driver's head restraint is adjusted to the lowest and most full forward in-use position.

Seat	Total # of Positions	Placed in Position #
Driver Seat	5	5 - Lowest

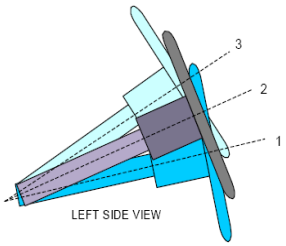
DATA SHEET NO. 2 … (CONTINUED)
SEAT, SEAT BELT, STEERING WHEEL ADJUSTMENT AND FUEL SYSTEMS DATA

Test Vehicle:	2016 Honda Civic four door sedan	NHTSA No.:	M20165301
Test Program:	NCAP Side Pole Impact Test	Test Date:	2/2/2016

STEERING COLUMN ADJUSTMENT

Steering wheel and column adjustments are made so that the steering wheel hub is at the center of its geometric locus it describes when it moves through its full range of motion.

	Degrees	Fore / Aft Position (mm)
Lowermost – Position 1	16.7	
Geometric Center – Position 2	19.6	
Uppermost – Position 3	22.4	
Telescoping Steering Wheel Travel		40
Test Position	19.6	20

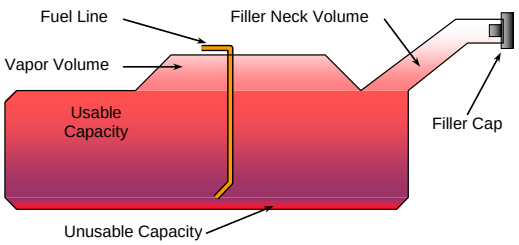


STEERING COLUMN ASSEMBLY

FUEL PUMP

Describe the fuel pump type, details about how it operates, and the location of the fuel filler neck.

The vehicle is equipped with an electric fuel pump. The fuel filler neck is on the left side of the vehicle. The pump creates positive pressure in the fuel lines, pushing the gasoline to the engine. See form 1 for more information.



VEHICLE FUEL TANK ASSEMBLY

FUEL TANK CAPACITY DATA

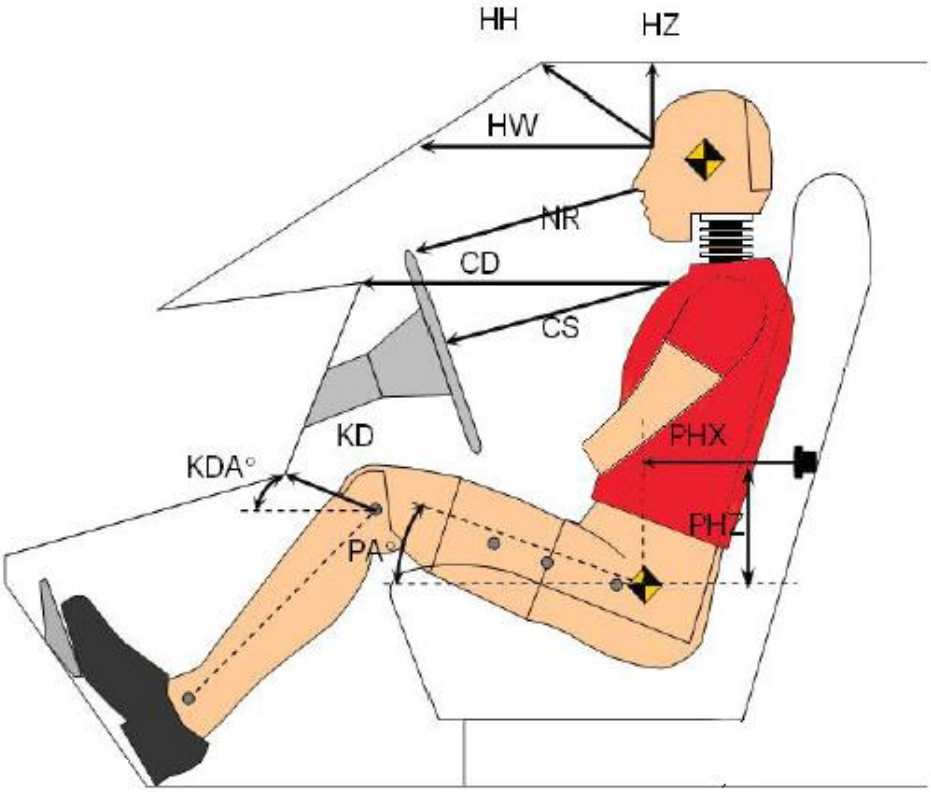
Description			Liters
Usable Capacity of “Standard Tank”	-	see Form No. 1	47
Usable Capacity of “Optional Tank”	-	see Form No. 1	
Usable Capacity of “Standard Tank”	-	see Owner’s Manual	47
Usable Capacity of “Optional Tank”	-	see Owner’s Manual	
93% of Usable Capacity			43.7
Actual Amount of Solvent Used in Test			43.7
1/3 of Usable Capacity			15.7

Is the Actual Amount of Solvent Used in the test equal to 93% ±1% of the Usable Capacity stated in Form No. 1?

[X] Yes [ ] No

DATA SHEET NO. 3
DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle:	2016 Honda Civic four door sedan	NHTSA No.:	M20165301
Test Program:	NCAP Side Pole Impact Test	Test Date:	2/2/2016



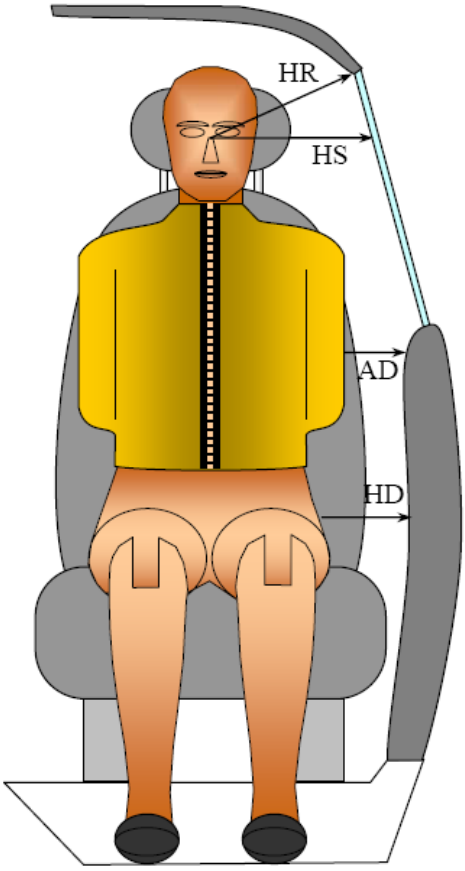
Left Side View

DUMMY LONGITUDINAL CLEARANCE DIMENSION INFORMATION

Driver Code	Description	Driver (Serial No. 303)	
		Length (mm)	Angle (◦)
HH	Head to Header	278	
HW	Head to Windshield	575	
HZ	Head to Roof Liner	193	
NR	Nose to Rim	230	
CD	Chest to Dash	400	
CS	Chest to Steering Wheel	190	
KD(L) / KDA(L)◦	Left Knee to Dash	126	44.8
KD(R) / KDA(R)◦	Right Knee to Dash	128	36.0
PAX◦	Pelvic Tilt Angle (X-Axis)		0.2
PAY◦	Pelvic Tilt Angle (Y-Axis)		20.0
PHX	Hip Point to Striker (X-Axis)	362	
PHZ	Hip Point to Striker (Z-Axis)	240	

DATA SHEET NO. 4
DUMMY LATERAL CLEARANCE DIMENSIONS

Test Vehicle:	2016 Honda Civic four door sedan	NHTSA No.:	M20165301
Test Program:	NCAP Side Pole Impact Test	Test Date:	2/2/2016



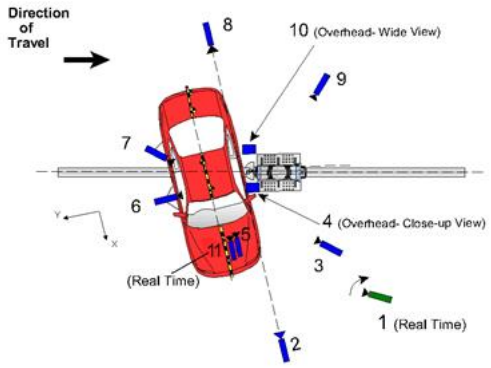
FRONT VIEW OF DUMMY

DUMMY LATERAL CLEARANCE DIMENSION INFORMATION

Code	Measurement Description	Units	Driver - Length (Serial No. 303)
HR	Head To Side Header	mm	247
HS	Head to Side Window	mm	380
AD	Arm to Door	mm	175
HD	Hip Point to Door	mm	170

DATA SHEET NO. 5
CAMERA AND INSTRUMENTATION DATA

Test Vehicle: 2016 Honda Civic four door sedan NHTSA No.: M20165301
Test Program: NCAP Side Pole Impact Test Test Date: 2/2/2016



CAMERA LOCATIONS AND DATA

No.	Camera View	Coordinates (mm)			Lens Length (mm)	Operating Frame Rate (fps)
		X	Y	Z		
1	Real-time (24 - 30 fps) pan view of impact				Zoom	60
2	Front ground level - impact view	6894	0	-1143	24	1000
3	Impact side 45º - forward pole view	4069	-2150	-1735	24	1000
4	Overhead Close-up view of impact	0	0	-5203	24	1000
5	Onboard - dummy front view				25	1000
6	Onboard - dummy side view				12.5	1000
7	Onboard - dummy rear oblique view				12.5	1000
8	Rear ground level - impact view	-7328	0	-1181	24	1000
9	Impact side 45º - rearward pole view	-2275	-4121	-1763	24	1000
10	Overhead wide - view of impact	-79	305	-5203	14	1000
11	Real-time (24 - 30 fps) - dummy front view				Zoom	1000

Notes: *Reference - From Point of Impact for X and Y; from Ground for Z*
+X = Forward of vehicle, +Y = Right of vehicle, +Z = Down
** All measurements accurate to ± 6 mm.* *Vehicle is at a 75º angle to the rigid pole.*

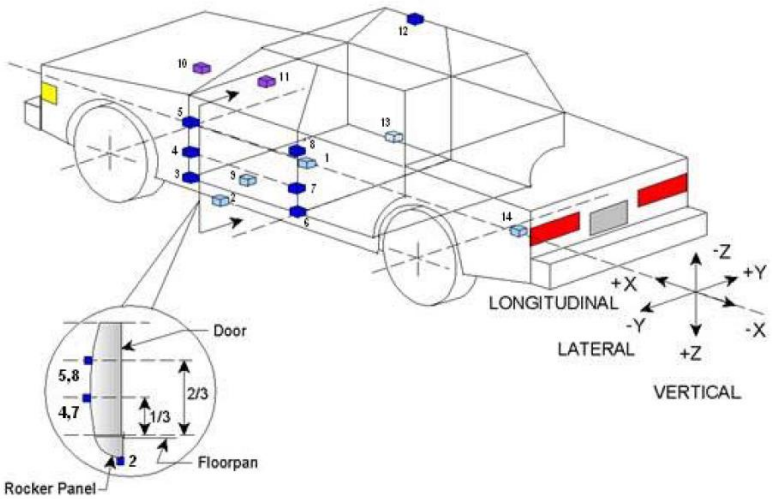
Comments: All cameras operated as intended.

INSTRUMENTATION

Description	Number of Channels
Driver Dummy Channels	16
Vehicle Structure Accelerometers	18
Pole Load Cells	8
Total	42

DATA SHEET NO. 6
VEHICLE ACCELEROMETER DATA

Test Vehicle:	2016 Honda Civic four door sedan	NHTSA No.:	M20165301
Test Program:	NCAP Side Pole Impact Test	Test Date:	2/2/2016



TEST VEHICLE ACCELEROMETER LOCATIONS

No.	Accelerometer Location	Coordinates (mm)		
		X	Y	Z
1	Vehicle CG	2571	-2	-129
2	Left Floor Sill	2897	-715	-203
3	A-Pillar Sill	3150	-689	-238
4	A-Pillar Low	3200	-690	1
5	A-Pillar Mid	3138	-649	420
6	B-Pillar Sill	2138	-687	-280
7	B-Pillar Low	2189	-666	-93
8	B-Pillar Mid	2144	-668	163
9	Driver Seat Track	2474	-560	-257
10	Engine Top	3930	-55	257
11	Firewall	3622	-172	284
12	Right Roof	2216	549	857
13	Right Floor Sill	2876	713	-199
14	Rear Floorpan	1175	2	28

Reference: *X – Rear surface of vehicle (+ forward)*
Y – Vehicle centerline (+ to right)
Z – Ground plane (+ down)

DATA SHEET NO. 7
RIGID POLE LOAD CELL DATA

Test Vehicle:	2016 Honda Civic four door sedan	NHTSA No.:	M20165301
Test Program:	NCAP Side Pole Impact Test	Test Date:	2/2/2016

POLE BARRIER

RIGID POLE LOAD CELL LOCATIONS

ID	Units	Height From Ground
1	mm	200
2	mm	590
3	mm	750
4	mm	1075
5	mm	1260
6	mm	1740
7	mm	1920
8	mm	2300

DATA SHEET NO. 8
POST-TEST OBSERVATIONS

Test Vehicle: 2016 Honda Civic four door sedan NHTSA No.: M20165301
Test Program: NCAP Side Pole Impact Test Test Date: 2/2/2016

TEST DUMMY INFORMATION AND CONTACT POINTS

Dummy Body Part	Driver Seat Dummy (SID-IIs)
Face	Curtain & Front Airbag
Top of Head	Curtain Airbag
Left Side of Head	Curtain Airbag
Back of Head	Curtain Airbag & Seatback
Left Shoulder	Torso/Pelvis Airbag & Seatback
Upper Torso	Seatback
Lower Torso	Seatback
Left Hip	Torso/Pelvis Airbag & Seatpan
Left Knee	None

POST-TEST DOOR PERFORMANCE

Description	Struck Side		Non-Struck Side		Rear Hatch/ Other
	Front	Rear	Front	Rear	
Remained Closed and Operational	No	No	Yes	Yes	Yes
Total Separation from Vehicle at Hinges or Latches	0	0	0	0	0
Latch or Hinge Systems Pulled Out of Their Anchorages	No	No	No	No	No
Disengaged from Latched Position	No	No	No	No	No
Latch Separated from Striker	No	No	No	No	No
Jammed Shut	Yes	Yes	No	No	No
If Door Opened at Striker, Width of Opening at Striker (mm)	0	0	0	0	0

POST-TEST SEAT PERFORMANCE

Description	Struck Side		Non-Struck Side	
	Front	Rear	Front	Rear
Seat Movement Along Seat Track	No	No	No	No
Seat Disengagement from Floor Pan	No	No	No	No
Seat Back Movement from Initial Position	No	No	No	No
Seat Back Collapse	No	No	No	No

DATA SHEET NO. 8 … (CONTINUED)
POST-TEST OBSERVATIONS

Test Vehicle: 2016 Honda Civic four door sedan NHTSA No.: M20165301
Test Program: NCAP Side Pole Impact Test Test Date: 2/2/2016

POST-TEST STRUCTURAL OBSERVATIONS

Critical Areas of Performance	Observations and Conclusions
Pillar Performance	A-Pillar Buckled
Sill Separation	None
Windshield Damage	Cracks throughout with separation along driver's A-Pillar
Side Window Damage	Driver's window shattered
Other Notable Effects	None

SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

Restraint Type	Struck Side Driver		Struck Side Rear Passenger	
	Mounted	Deployed	Mounted	Deployed
Frontal Airbag	Yes	Yes		
Knee Airbag	No	N/A		
Side Airbag 1 - Curtain	Yes	Yes	Yes	Yes
Side Airbag 2 – Torso/Pelvis	Yes	Yes	No	N/A
Seat Belt Pretensioner	Yes	Yes	No	N/A
Seat Belt Load Limiter	Yes	Yes	No	N/A
Other				

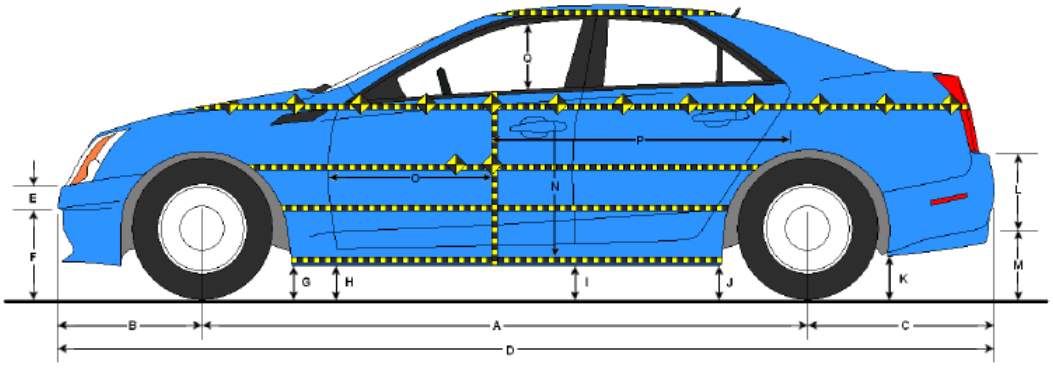
VEHICLE SPEED, VEHICLE ANGLE AT IMPACT AND IMPACT POINT LOCATION DATA

Measured Parameter		Units	Tolerance	Value
Vertical Impact Ref Line	- Aft of Front Axle, Intended Impact Pt	mm		1119
Actual Impact Point	- Aft of Front Axle	mm		1122
Horizontal Offset (+ forward / - rearward)		mm	+/- 38 *	-3
Angle Between Vehicle's Longitudinal Centerline and Line of Forward Motion		deg	75 +/- 3	75.0
Trap No. 1 Velocity	- Primary	kph	31.4 to 33.0	32.20
Trap No. 2 Velocity	- Redundant	kph	31.4 to 33.0	32.21

* Of Intended Impact Point

DATA SHEET NO. 9
TEST VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2016 Honda Civic four door sedan
NHTSA No.: M20165301
Test Program: NCAP Side Pole Impact Test
Test Date: 2/2/2016



LEFT SIDE VIEW

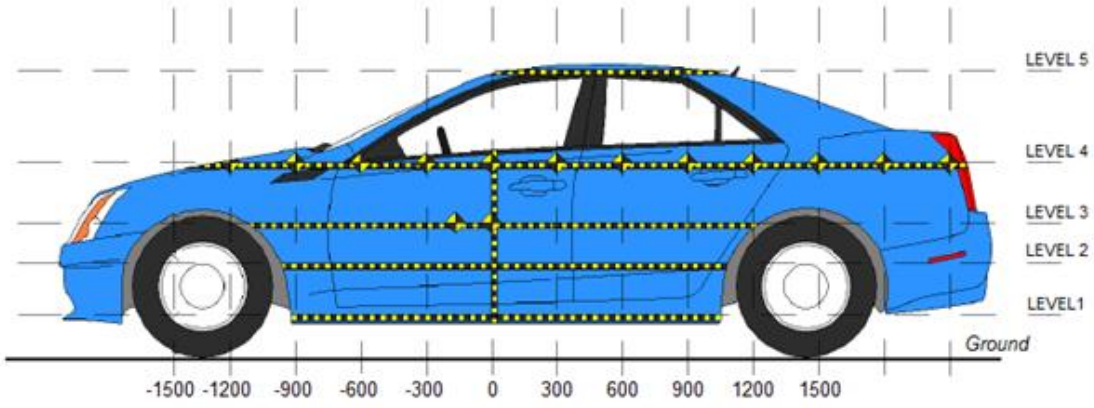
VEHICLE PRE- AND POST-TEST MEASUREMENT INFORMATION

Code	Description	Pre-Test	Post-Test	Difference
A	Vehicle Wheelbase	2699	2641	58
B	Front Axle to FSOV	894	957	-64
C	Rear Axle to RSOV	1033	1030	2
D	Total Length at Centerline	4625	4628	-3
E	Front Bumper Thickness	90	90	0
F	Front Bumper Bottom to Ground	339	356	-17
G	Sill Height at Front Wheel Well	178	175	3
H	Sill Height at Front Door Leading Edge	177	176	1
I	Sill Height at B-Pillar	183	194	-11
J1	Sill Height at Rear Wheel Well	184	198	-14
J2	Pinch Weld Height at Rear Wheel Well	183	194	-11
K	Sill Height Aft of Rear Wheel Well	256	245	11
L	Rear Bumper Thickness	120	120	0
M	Rear Bumper Bottom to Ground	371	344	27
N	Sill Height to Bottom of Front Window Sill	680	689	-9
O	Front Door Leading Edge to Impact CL	635	571	64
P	Rear Door Trailing Edge to Impact CL	1438	1381	57
Q	Front Window Opening	346	337	9
R	Right Side Length	4516	4528	-11
S	Left Side Length	4520	4514	6
T	Vehicle Width at B-Pillars	1790	1736	55

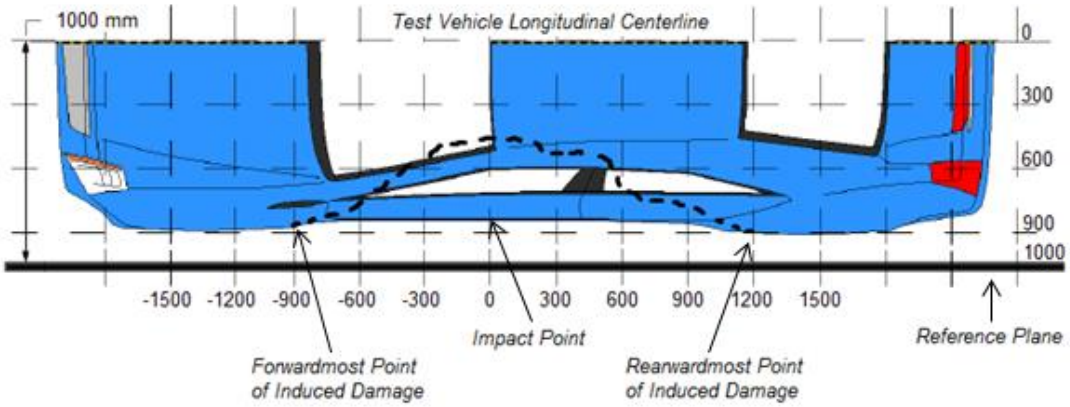
* All measurements in mm with tolerance of ± 3mm

DATA SHEET NO. 10
TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle:	2016 Honda Civic four door sedan	NHTSA No.:	M20165301
Test Program:	NCAP Side Pole Impact Test	Test Date:	2/2/2016



Left Side View



Overhead View

MAXIMUM EXTERIOR CRUSH MEASUREMENTS

Level	Measurement Description	Units	Height Above Ground	Maximum Exterior Static Crush	Distance from Impact
1	Sill Top	mm	280	235	0
2	Occupant Hip Point	mm	523	289	0
3	Mid - Door	mm	609	297	0
4	Window Sill	mm	877	257	0
5	Window Top	mm	1335	65	0

NOTE: *The above measurements should be taken along the vertical impact reference line. Vehicle measurements forward of the vertical impact reference line are negative.*

DATA SHEET NO. 10 … (CONTINUED)
TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2016 Honda Civic four door sedan NHTSA No.: M20165301
Test Program: NCAP Side Pole Impact Test Test Date: 2/2/2016

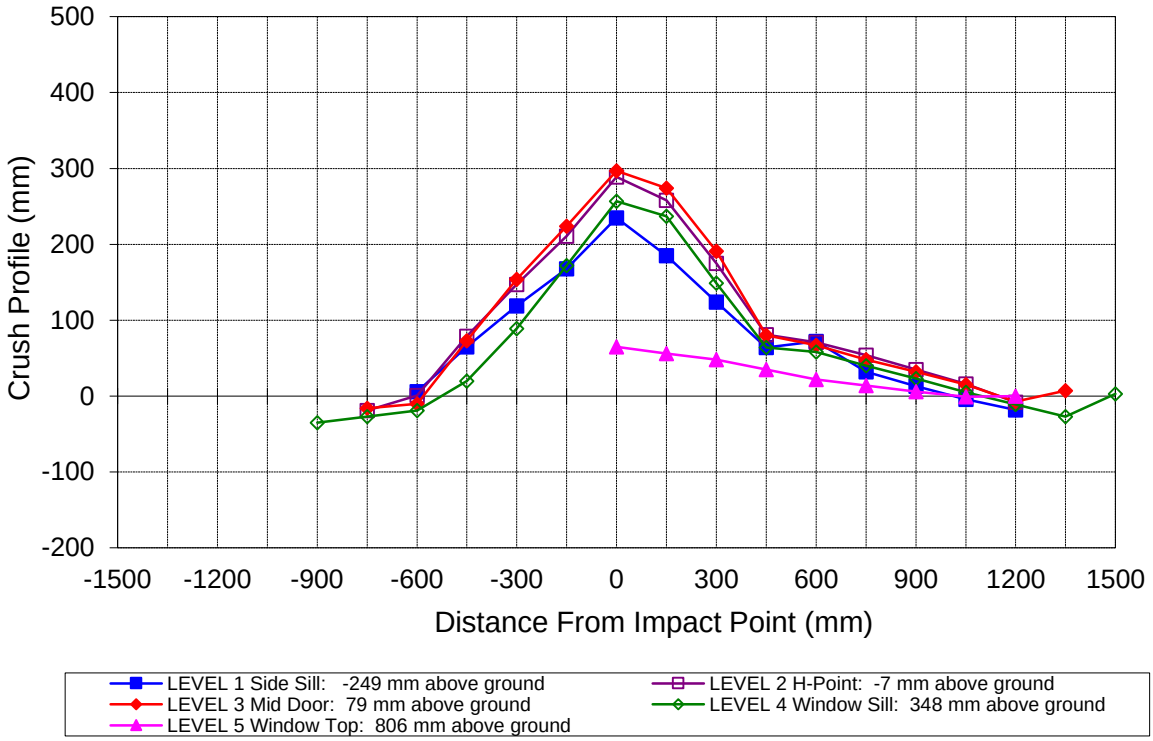
EXTERIOR CRUSH MEASUREMENTS AT EACH LEVEL

	Pre-Test					Post-Test					Difference				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
-1500															
-1350															
-1200															
-1050															
-900				808					843					-35	
-750		900	900	811			919	916	838			-19	-16	-27	
-600	866	895	894	809		860	894	904	828		6	1	-10	-19	
-450	848	892	893	817		783	813	820	797		65	79	73	20	
-300	844	893	896	828		725	746	742	739		119	147	154	89	
-150	843	895	898	839		675	684	674	667		168	211	224	172	
0	846	895	899	849	578	611	606	602	592	513	235	289	297	257	65
150	849	895	900	856	604	664	637	626	619	548	185	258	274	237	56
300	850	894	899	863	613	726	719	708	714	565	124	175	191	149	48
450	852	892	898	868	616	788	811	818	804	581	64	81	80	64	35
600	852	888	895	871	617	780	817	828	813	595	72	71	67	58	22
750	853	885	890	872	615	821	831	842	832	601	32	54	48	40	14
900	864	882	887	871	606	851	847	855	848	600	13	35	32	23	6
1050	871	886	889	865	587	875	870	874	860	588	-4	16	15	5	-1
1200	878	895	897	864	472	896	903	904	875	472	-18	-8	-7	-11	0
1350			902	867				895	894				7	-27	
1500				870					867					3	

NOTE: *Pre-test measurements are taken when the vehicle is in the "As Tested" weight condition. Vehicle measurements forward of the vertical impact reference line are negative. The crush profile grid is established prior to the test based on an estimated impact point. The final distance from impact is determined after the final dummy positioning and the pole is aligned with the center of gravity of the dummy's head.*

DATA SHEET NO. 10 … (CONTINUED)
TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle:	2016 Honda Civic four door sedan	NHTSA No.:	M20165301
Test Program:	NCAP Side Pole Impact Test	Test Date:	2/2/2016

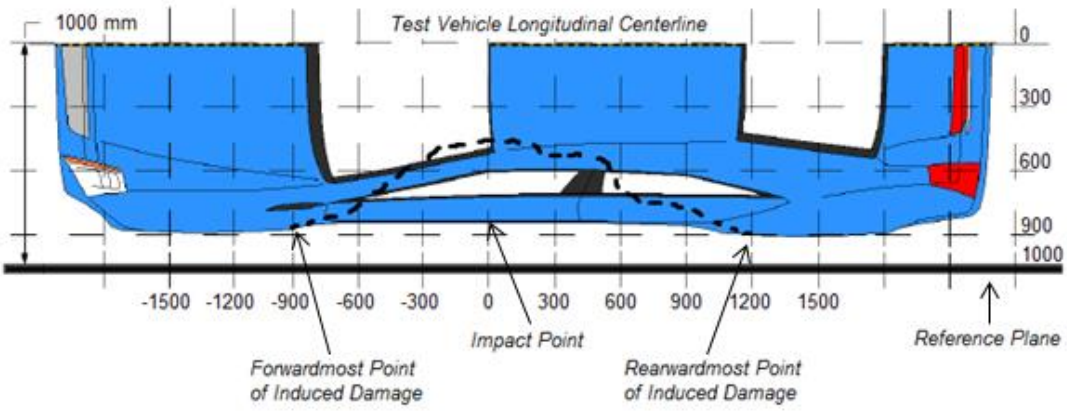


Vehicle Exterior Crush Measurements - Visual Representation

DATA SHEET NO. 11
VEHICLE DAMAGE PROFILE DISTANCES

Test Vehicle:	2016 Honda Civic four door sedan	NHTSA No.:	M20165301
Test Program:	NCAP Side Pole Impact Test	Test Date:	2/2/2016

For guidance regarding damage profile distance measurements, please refer to the latest version of the *NHTSA Test Reference Guide, Volume 1: Vehicle Tests.*



Overhead View

VEHICLE DAMAGE PROFILE DISTANCES

DPD	Distance From Impact Point (mm)	Level	Post-Test (mm)	Pre-Test (mm)	Crush (mm)
1	-750	3	84	100	-16
2	-330	3	242	105	137
3	90	3	384	100	284
4	510	3	178	103	75
5	930	3	141	113	28
6	1350	3	105	98	7

DATA SHEET NO. 12
FMVSS NO. 301 STATIC ROLLOVER RESULTS

Test Vehicle:	2016 Honda Civic four door sedan	NHTSA No.:	M20165301
Test Program:	NCAP Side MDB Impact Test	Test Date:	2/2/2016
Test Time:	11:58 AM	Temperature:	21° C

A. From impact until vehicle motion ceases: 0 oz.
(Maximum allowable is 1 oz.)

B. For the 5-minute period after motion ceases: 0 oz.
(Maximum allowable is 5 oz.)

C. For the following 25 minutes: 0 oz.
(Maximum allowable is 1 oz./minute)

D. Spillage Details: No Spillage Occurred

FMVSS NO. 301 STATIC ROLLOVER DATA

ROLLOVER SOLVENT COLLECTION TIME TABLE IN SECONDS

Test Phase	Rotation Time	Hold Time	Total Time
0° to 90°	72	300	372
90° to 180°	61	300	361
180° to 270°	61	300	361
270° to 360°	67	300	367

FMVSS NO. 301 ROLLOVER SPILLAGE TABLE

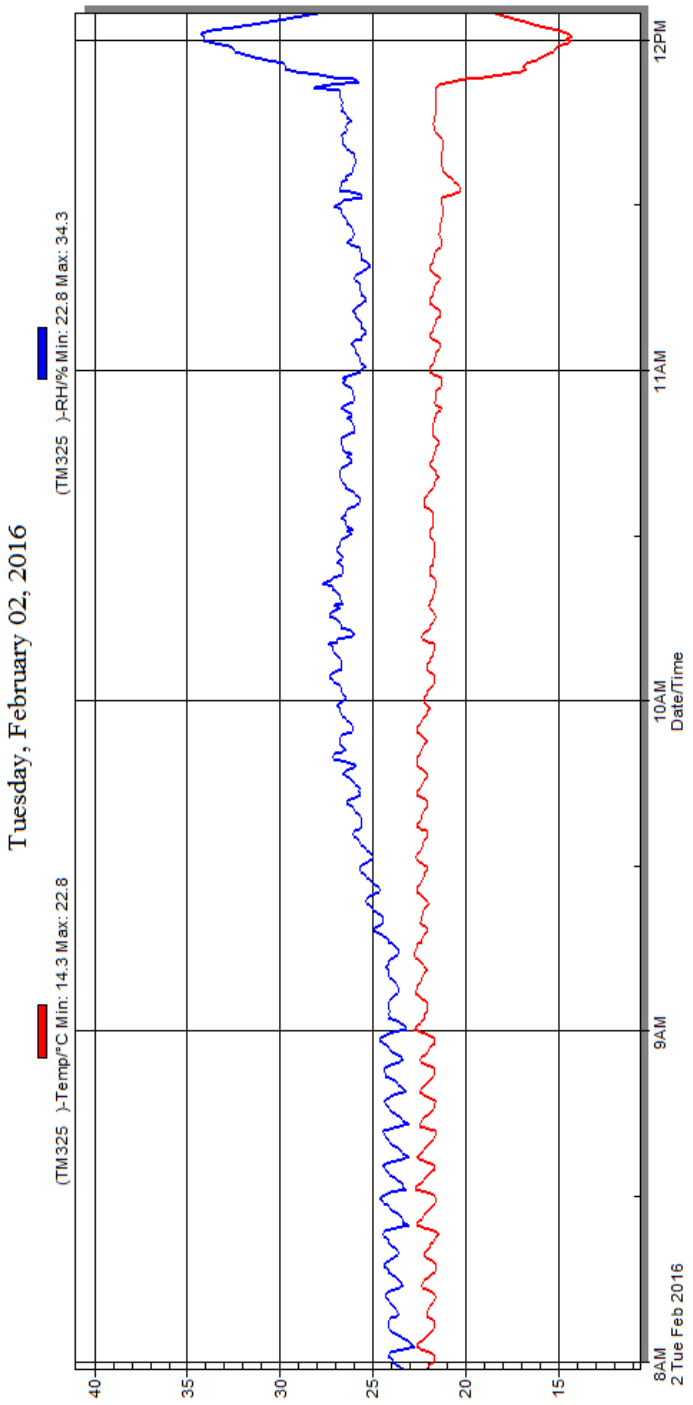
Test Phase	First 5 Minutes	Sixth Minute	Seventh Minute	Eighth Minute
0° to 90°	0	0	0	0
90° to 180°	0	0	0	0
180° to 270°	0	0	0	0
270° to 360°	0	0	0	0

ROLLOVER SOLVENT SPILLAGE LOCATION TABLE

Test Phase	Spillage Location
0° to 90°	No Spillage Occurred
90° to 180°	No Spillage Occurred
180° to 270°	No Spillage Occurred
270° to 360°	No Spillage Occurred

DATA SHEET NO. 13
DUMMY / VEHICLE TEMPERATURE AND HUMIDITY STABILIZATION DATA

Test Vehicle:	2016 Honda Civic four door sedan	NHTSA No.:	M20165301
Test Program:	NCAP Side Pole Impact Test	Test Date:	2/2/2016



Temperature and Humidity Stabilization Chart / Data for Dummies and Test Vehicle

APPENDIX A

PHOTOGRAPHS

TABLE OF PHOTOGRAPHS

Figure A-1: As Delivered Right Front ¾ View of Test Vehicle

Figure A-2: As Delivered Left Rear ¾ View of Test Vehicle

Figure A-3: Pre-Test Frontal View of Test Vehicle

Figure A-4: Post-Test Frontal View of Test Vehicle

Figure A-5: Pre-Test Left Front ¾ View of Test Vehicle

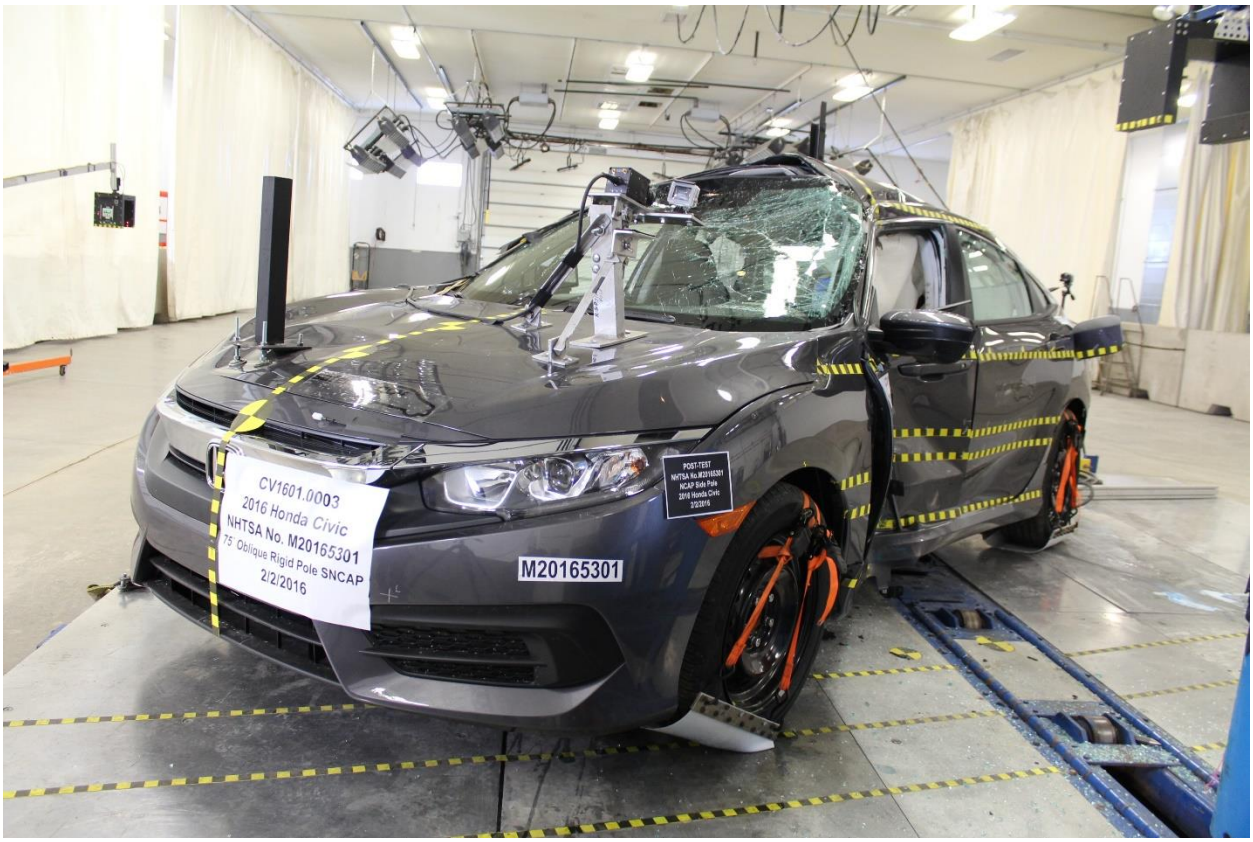


Figure A-6: Post-Test Left Front ¾ View of Test Vehicle

Figure A-7: Pre-Test Left Side View of Test Vehicle

Figure A-8: Post-Test Left Side View of Test Vehicle

Figure A-9: Pre-Test Left Rear ¾ View of Test Vehicle

Figure A-10: Post-Test Left Rear ¾ View of Test Vehicle

Figure A-11: Pre-Test Rear View of Test Vehicle

Figure A-12: Post-Test Rear View of Test Vehicle

Figure A-13: Pre-Test Right Side View of Test Vehicle

Figure A-14: Post-Test Right Side View of Test Vehicle

Figure A-15: Pre-Test Overhead View of Test Area

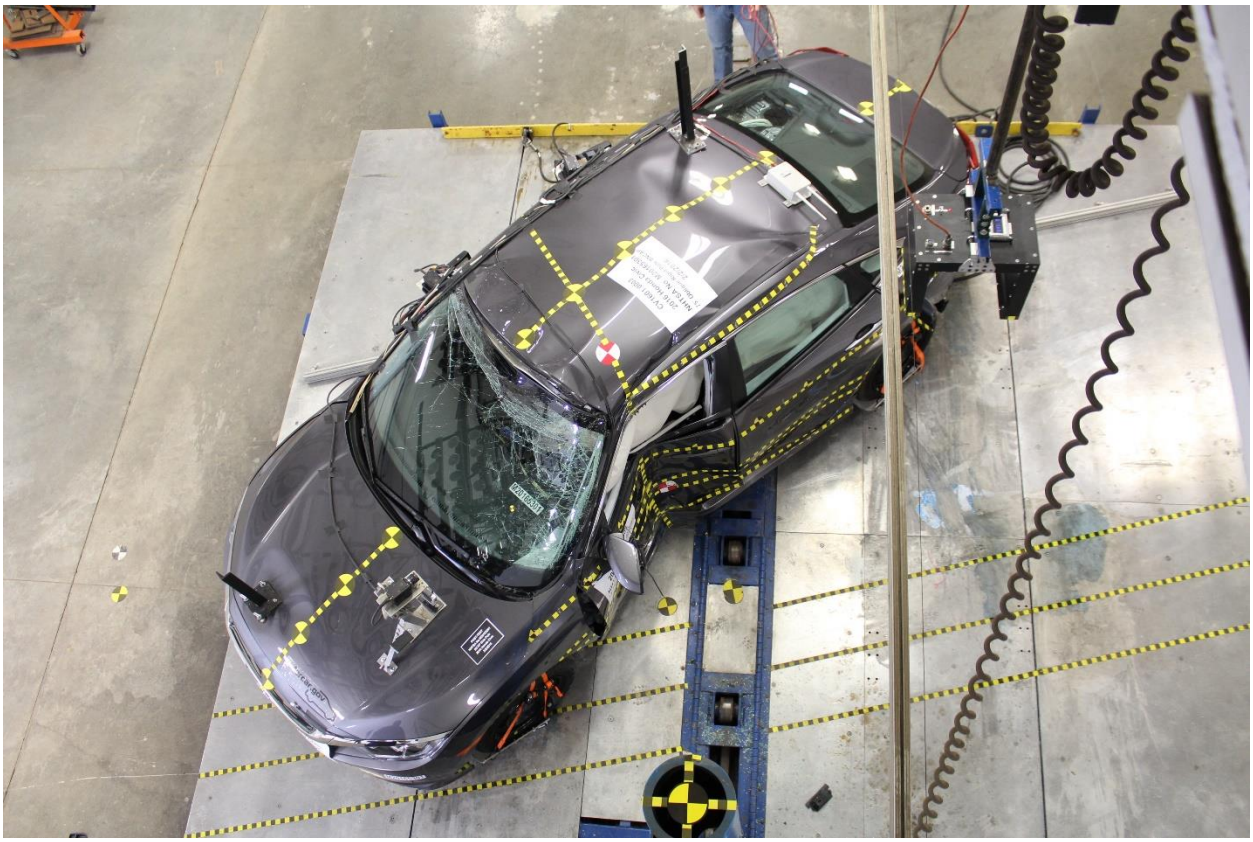


Figure A-16: Post-Test Overhead View of Test Area

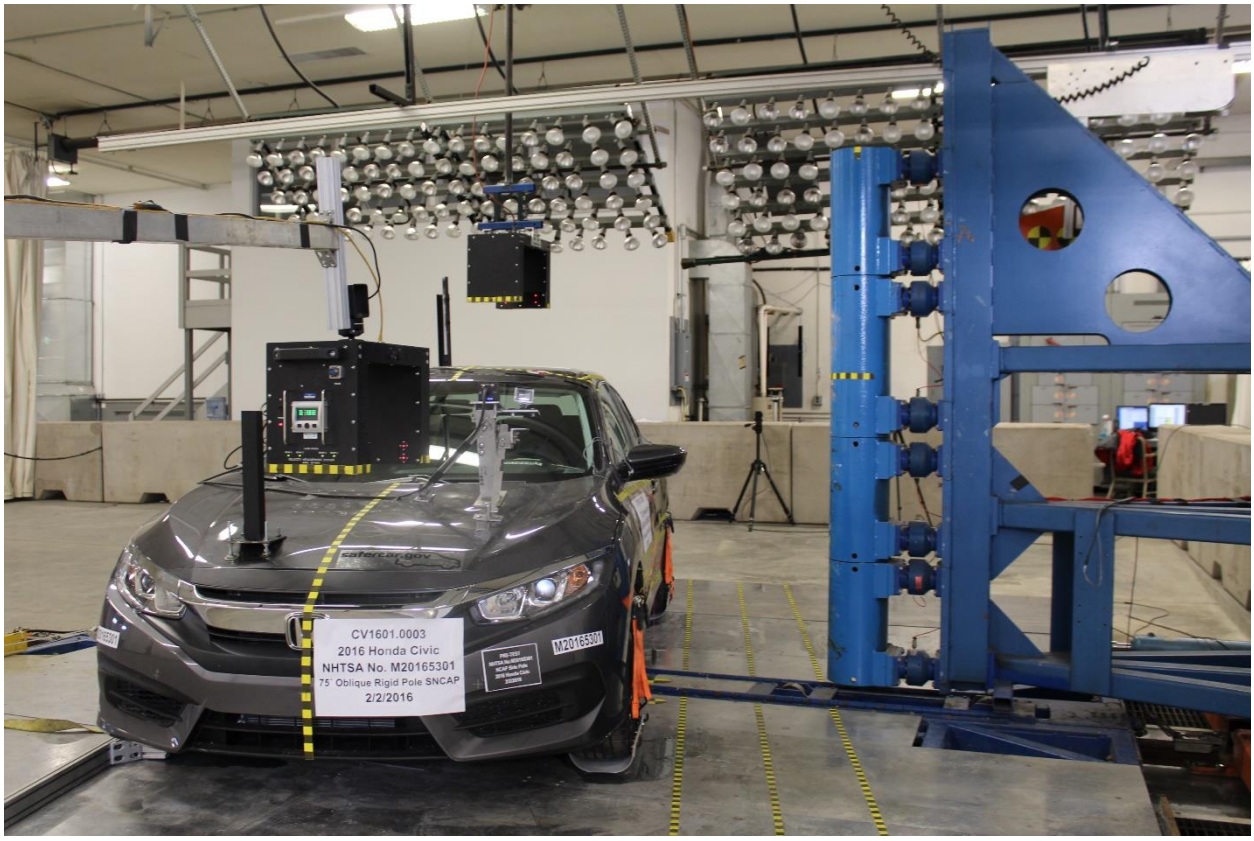


Figure A-17: Pre-Test Left Side View of Pole Positioned Against Side of Vehicle

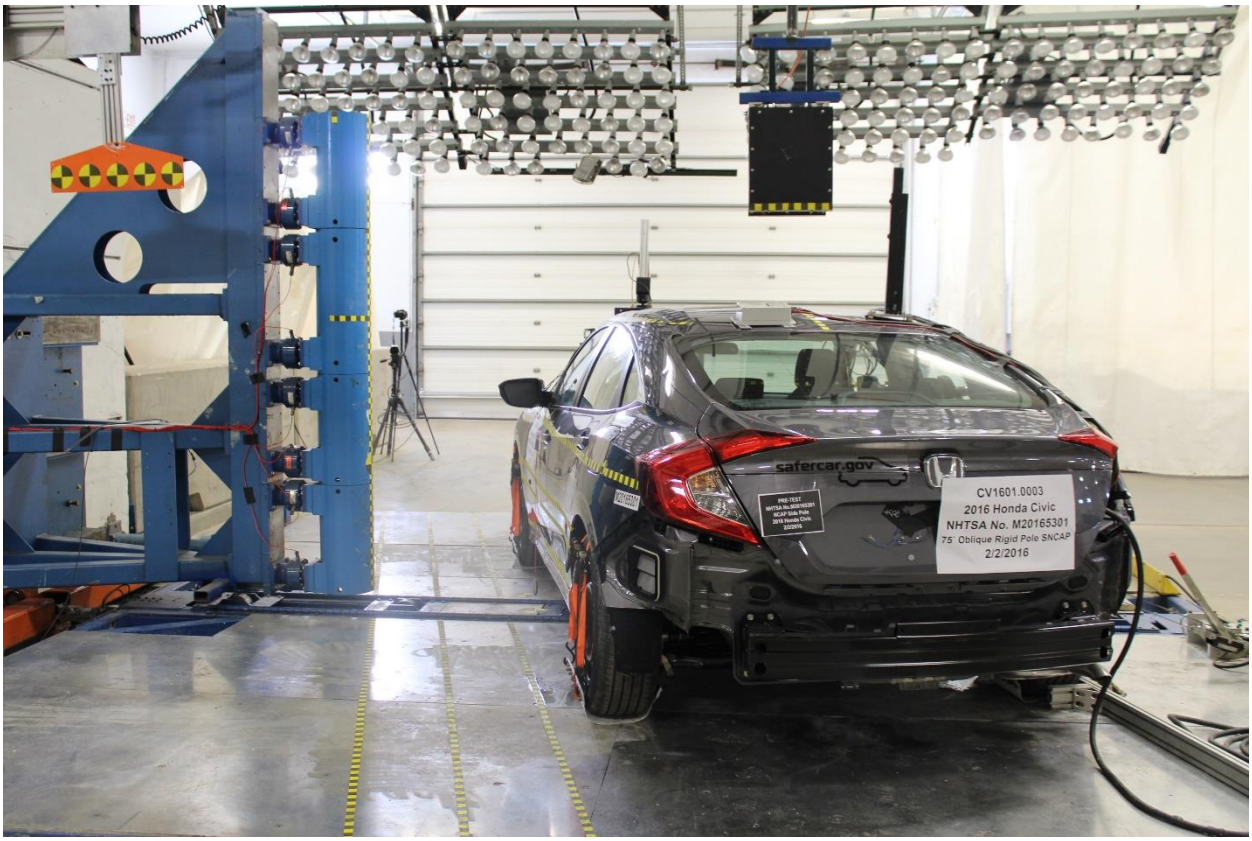


Figure A-18: Pre-Test Right Side View of Pole Positioned Against Side of Vehicle

Figure A-19: Pre-Test Close-Up View of Impact Point Target

Figure A-20: Post-Test Close-Up View of Impact Point Target Showing Impact Location

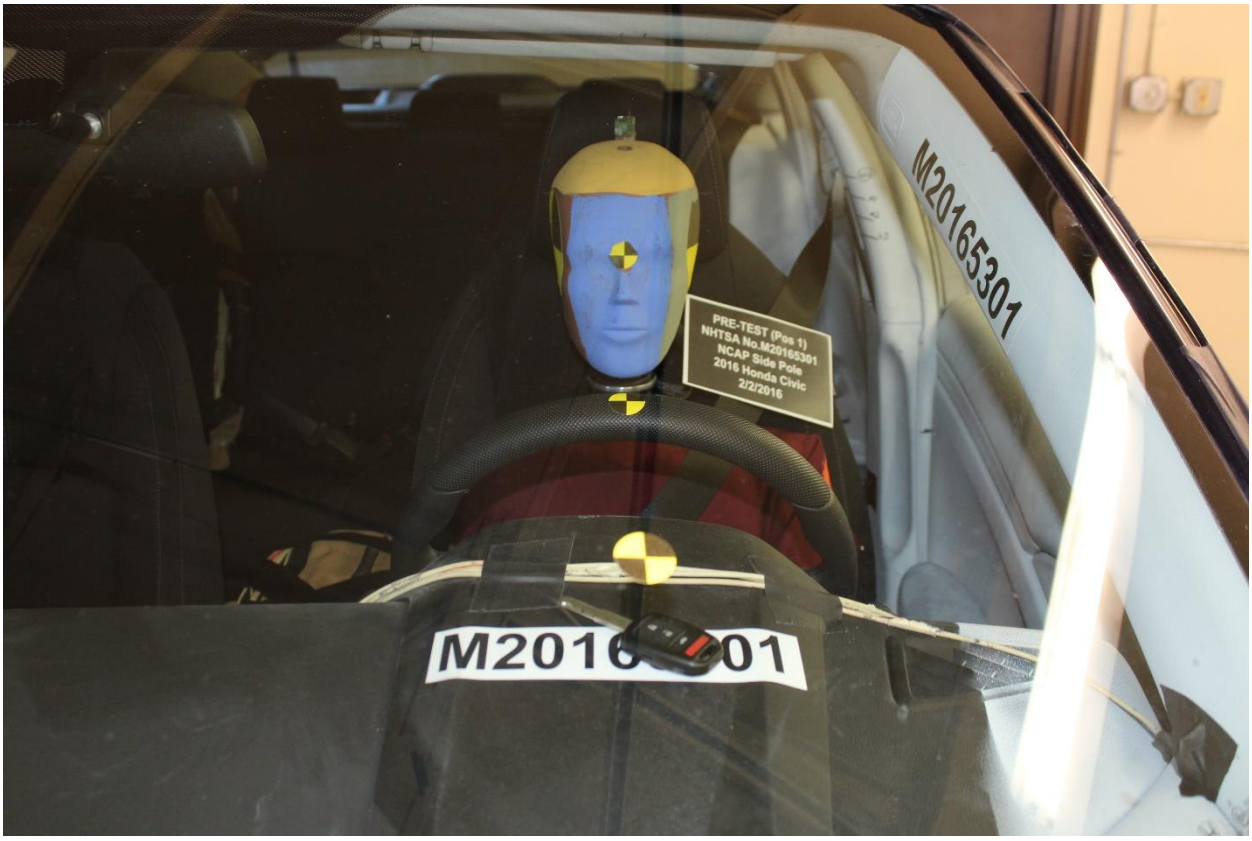


Figure A-21: Pre-Test Front Close-Up View of Dummy Head and Chest

Figure A-22: Post-Test Front Close-Up View of Dummy

Figure A-23: Pre-Test Left Side View of Dummy Showing Belt and Chalking

Figure A-24: Pre-Test Left Side View of Dummy Shoulder and Door Top View

Figure A-25: Post-Test Left Side View of Dummy Shoulder and Door Top View

Figure A-26: Pre-Test Frontal View of Seat Back Prior to Dummy Positioning

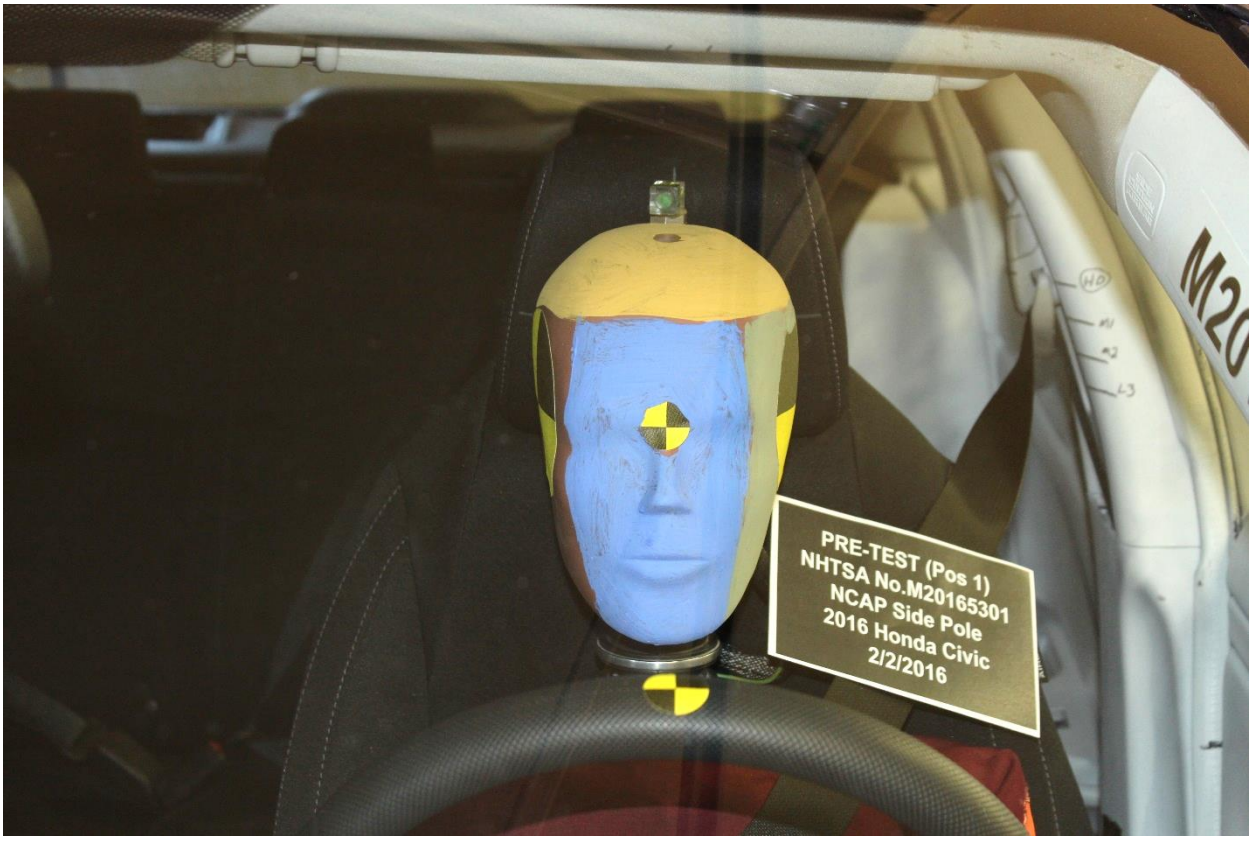


Figure A-27: Pre-Test Frontal Close-Up View of Dummy Head / Shoulders in Relation to Head Restraint

Figure A-28: Pre-Test Frontal View of Seat Pan Prior to Dummy Positioning

Figure A-29: Pre-Test Overhead View of Dummy Thighs on Seat Pan

Figure A-30: Pre-Test Left Side View of Dummy's Neck Showing Position of Adjustable Neck Bracket

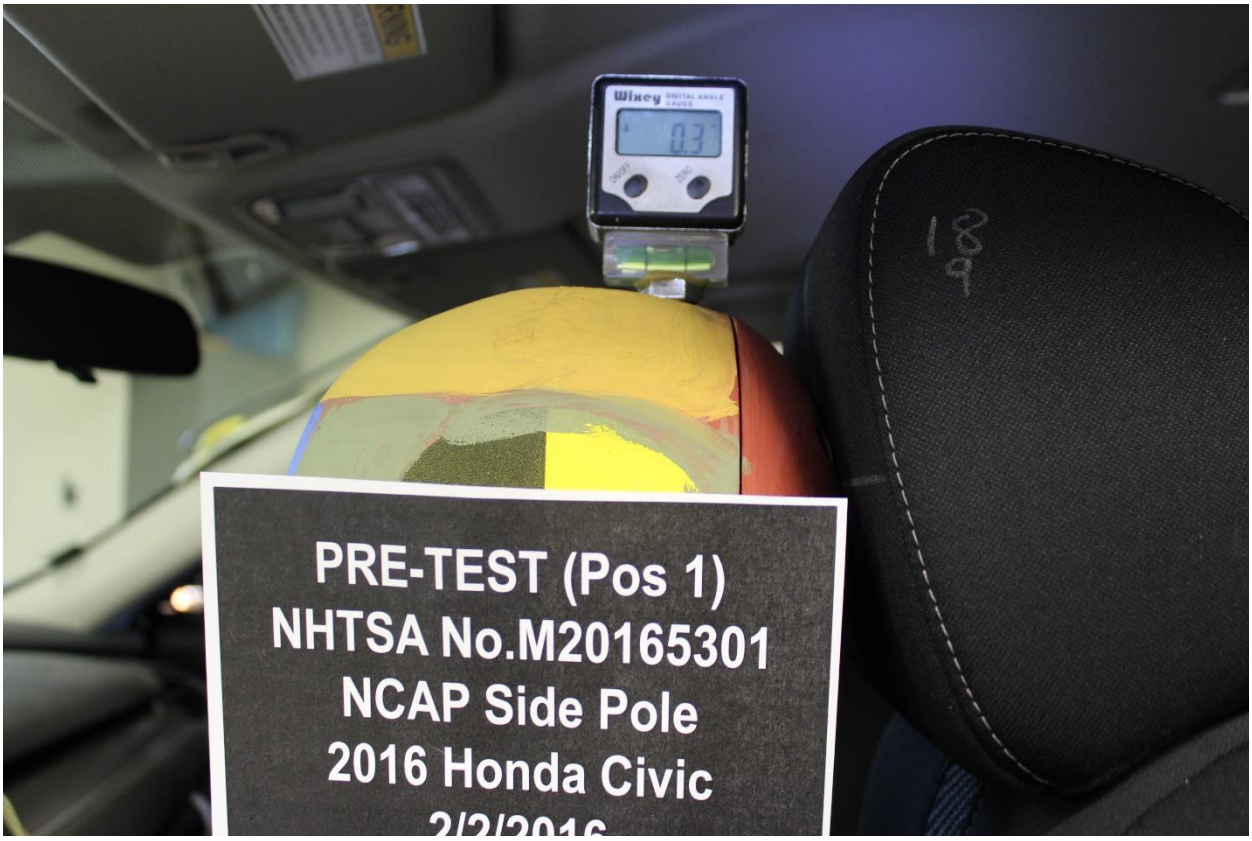


Figure A-31: Pre-Test Left Side View of Dummy's Head Showing Dummy's Head is Level

Figure A-32: Pre-Test Placement of Dummy's Feet

Figure A-33: Pre-Test View of Belt Anchorage for Dummy

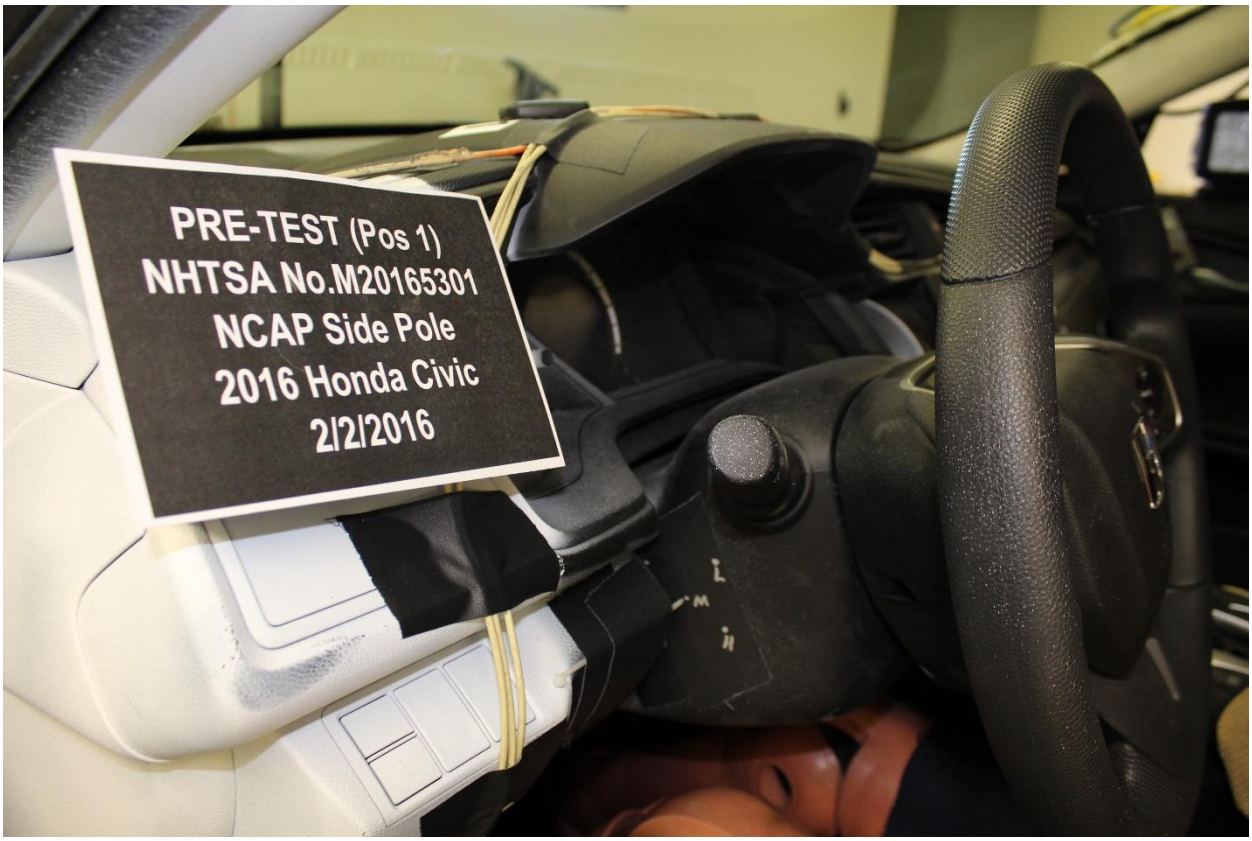


Figure A-34: Pre-Test Left Side View of Steering Wheel

Figure A-35: Pre-Test View of Disengaged Parking Brake

Figure A-36: Pre-Test View of Parking Brake

Figure A-37: Pre-Test Close-Up Left Side View of Driver Seat Track

Figure A-38: Pre-Test Close-Up Left Side View of Driver Seat Back

Figure A-39: Pre-Test Close-Up View of Driver Seat Back or Head Restraint

Figure A-40: Pre-Test Dummy and Door Clearance View

Figure A-41: Post-Test Dummy and Door Clearance View

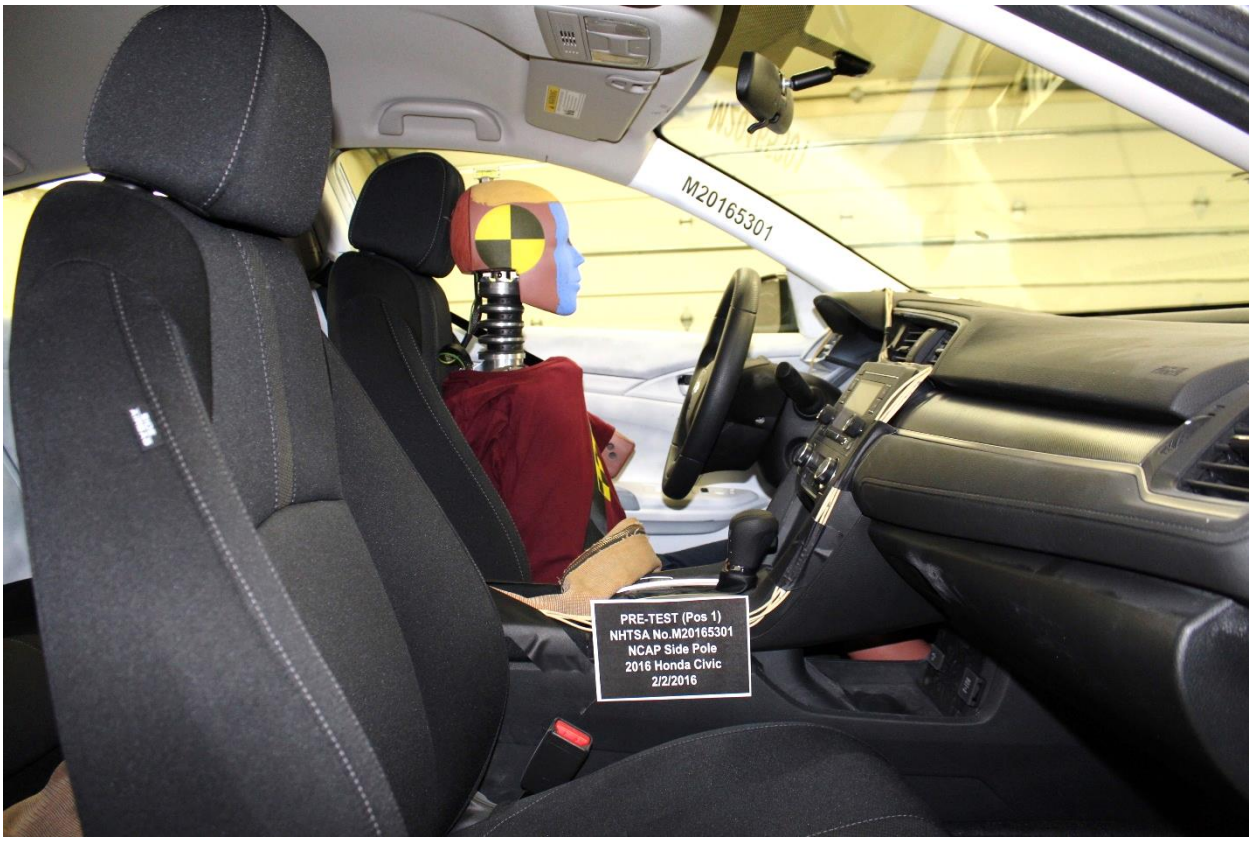


Figure A-42: Pre-Test Right Side View of Dummy and Front Seat of Occupant Compartment

Figure A-43: Post-Test Right Side View of Dummy and Front Seat of Occupant Compartment

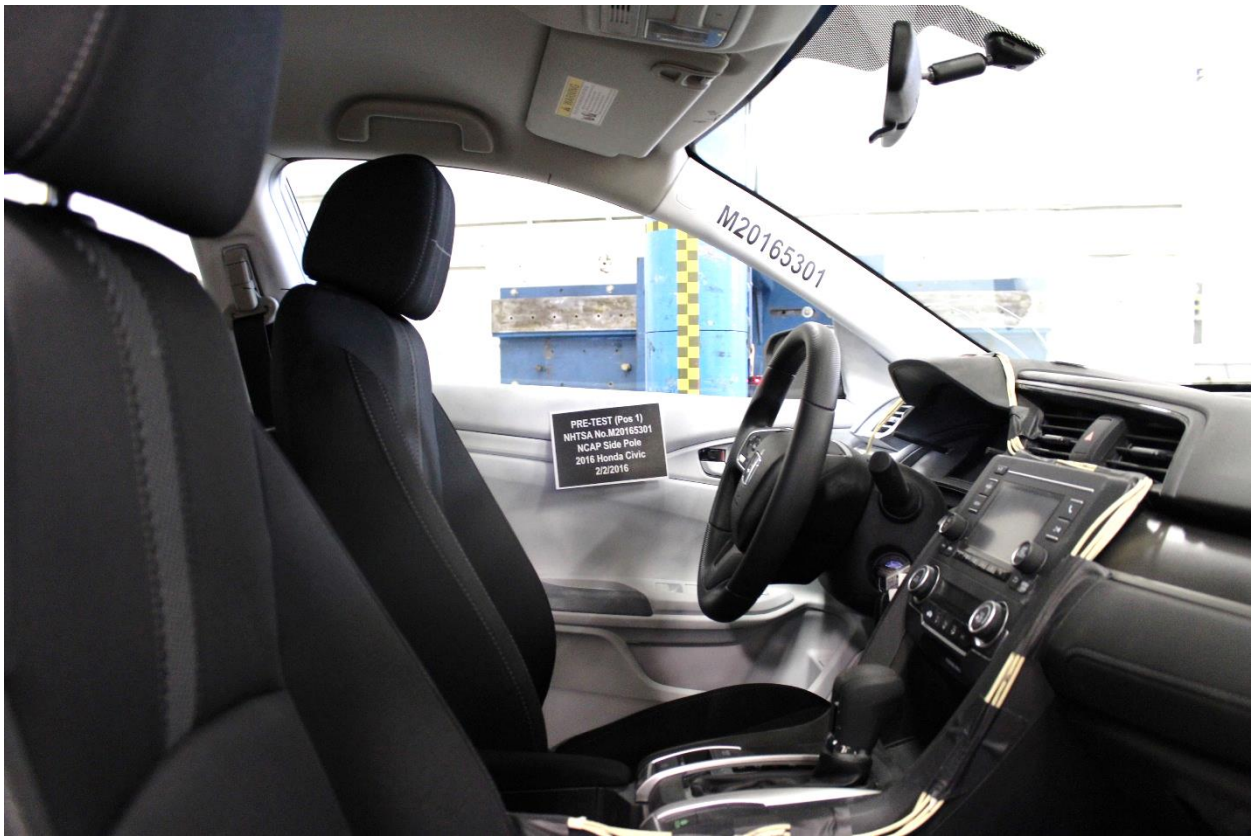


Figure A-44: Pre-Test Inner Door Panel View

Figure A-45: Post-Test Inner Door Panel View Showing Dummy Contact Location

Figure A-46: Post-Test Dummy Close-Up Head Contact with Vehicle Interior View

Figure A-47: Post-Test Dummy Close-Up Head Contact with Side Airbag View

Figure A-48: Post-Test Dummy Close-Up Torso Contact with Vehicle Interior View

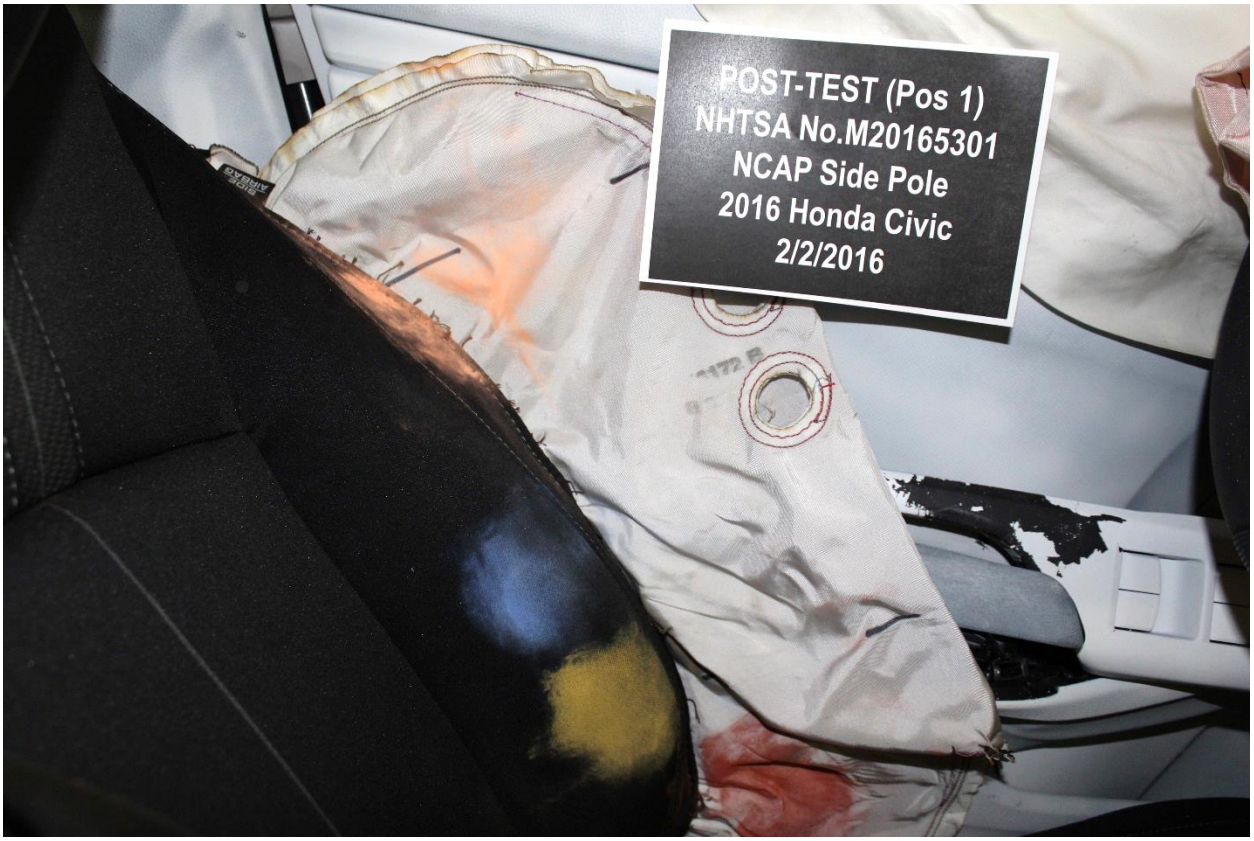


Figure A-49: Post-Test Dummy Close-Up Torso Contact with Side Airbag View

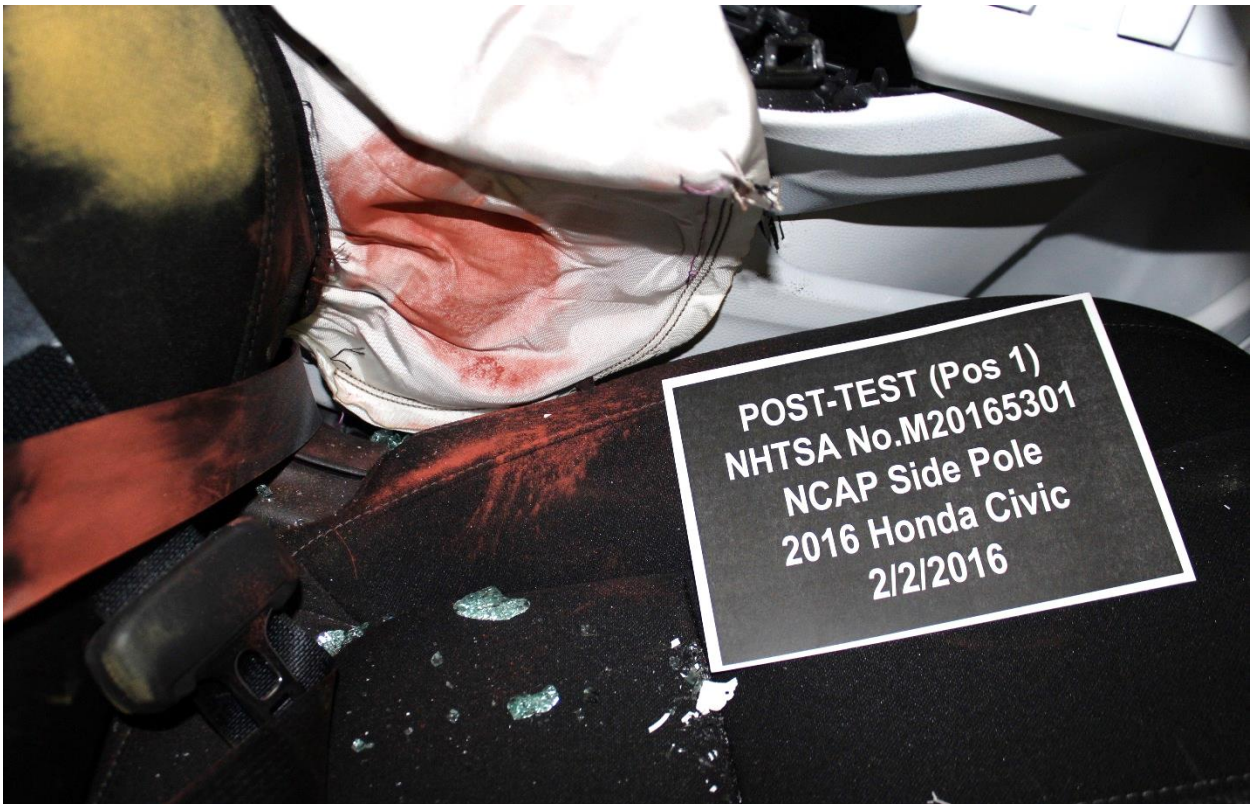


Figure A-50: Post-Test Dummy Close-Up Pelvis Contact with Vehicle Interior View

Figure A-51: Post-Test Dummy Close-Up Pelvis Contact with Side Airbag View

Photo Not Applicable

Figure A-52: Post-Test Dummy Close-Up Knee Contact with Vehicle Interior View

Figure A-53: Pre-Test View of Fuel Filler Cap or Fuel Filler Neck

Figure A-54: Post-Test View of Fuel Filler Cap or Fuel Filler Neck

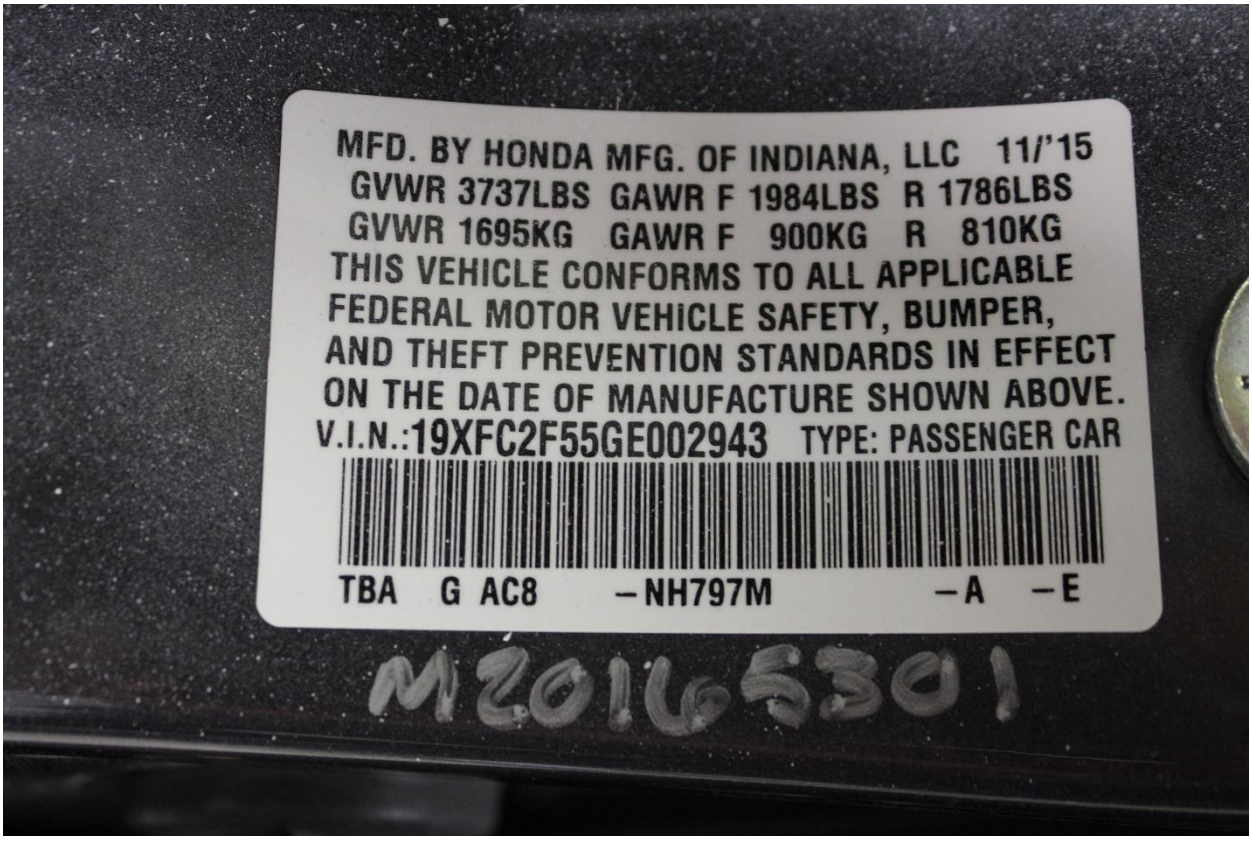


Figure A-55: Close-Up View of Vehicle's Certification Label

Photo Not Applicable

Figure A-55a: Close-Up View of Reduced Load Capacity Label

Figure A-56: Close-Up View of Vehicle's Tire Information Placard or Label

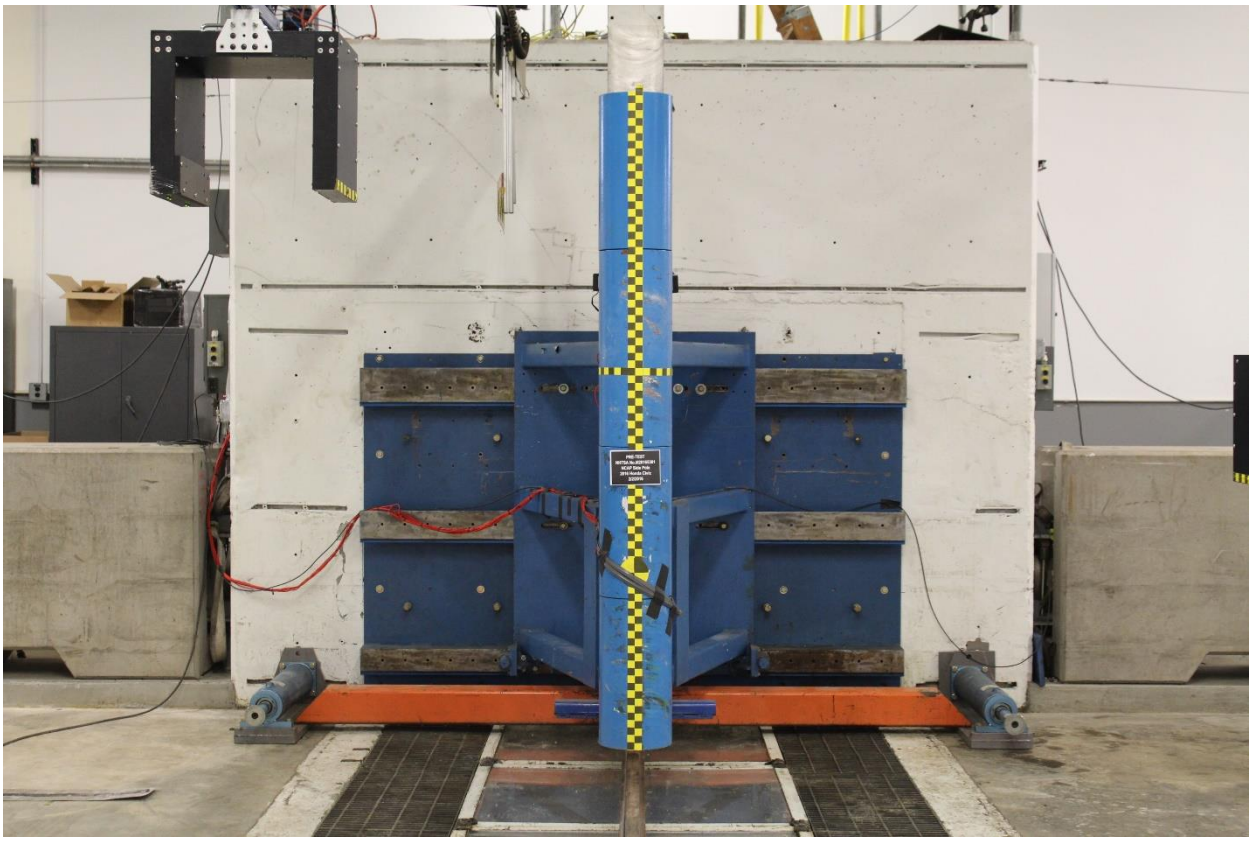


Figure A-57: Pre-Test Pole Barrier Front View

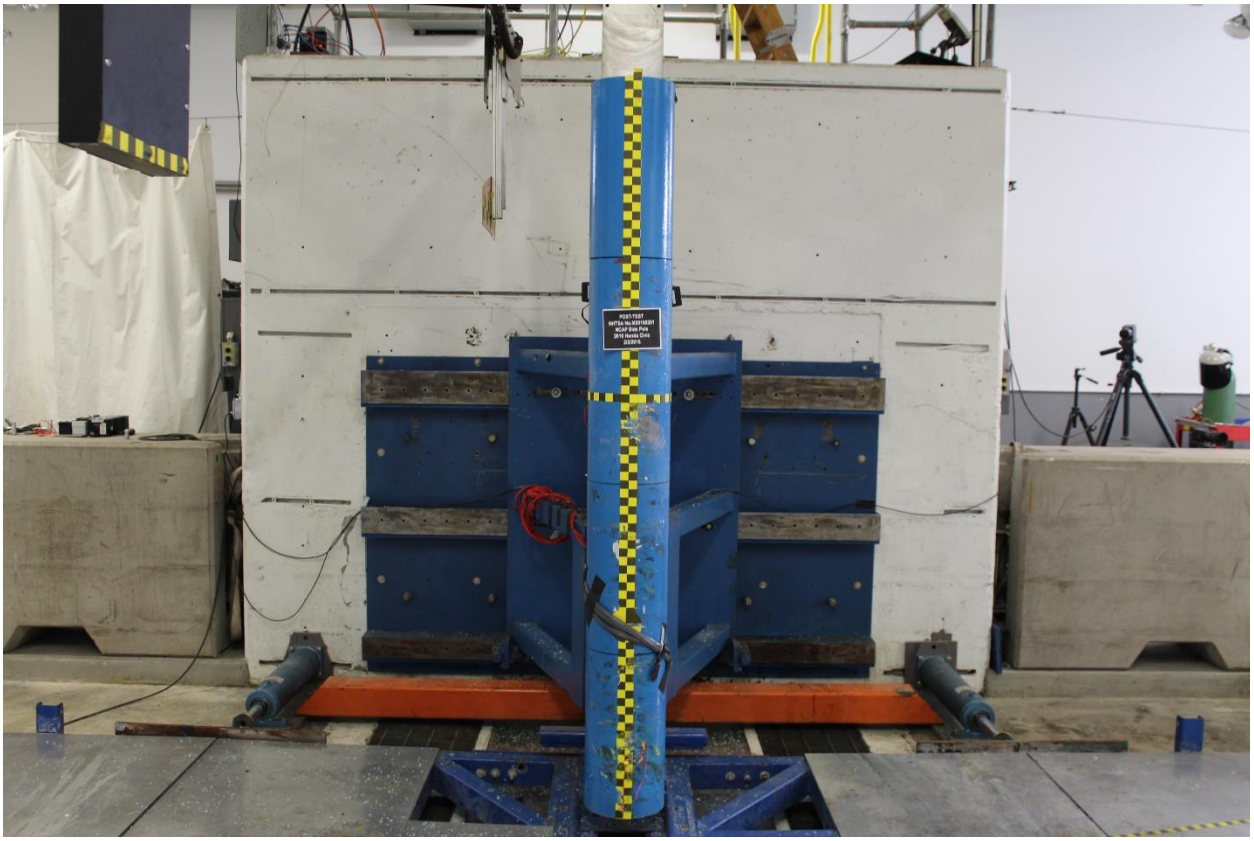


Figure A-58: Post-Test Pole Barrier Front View

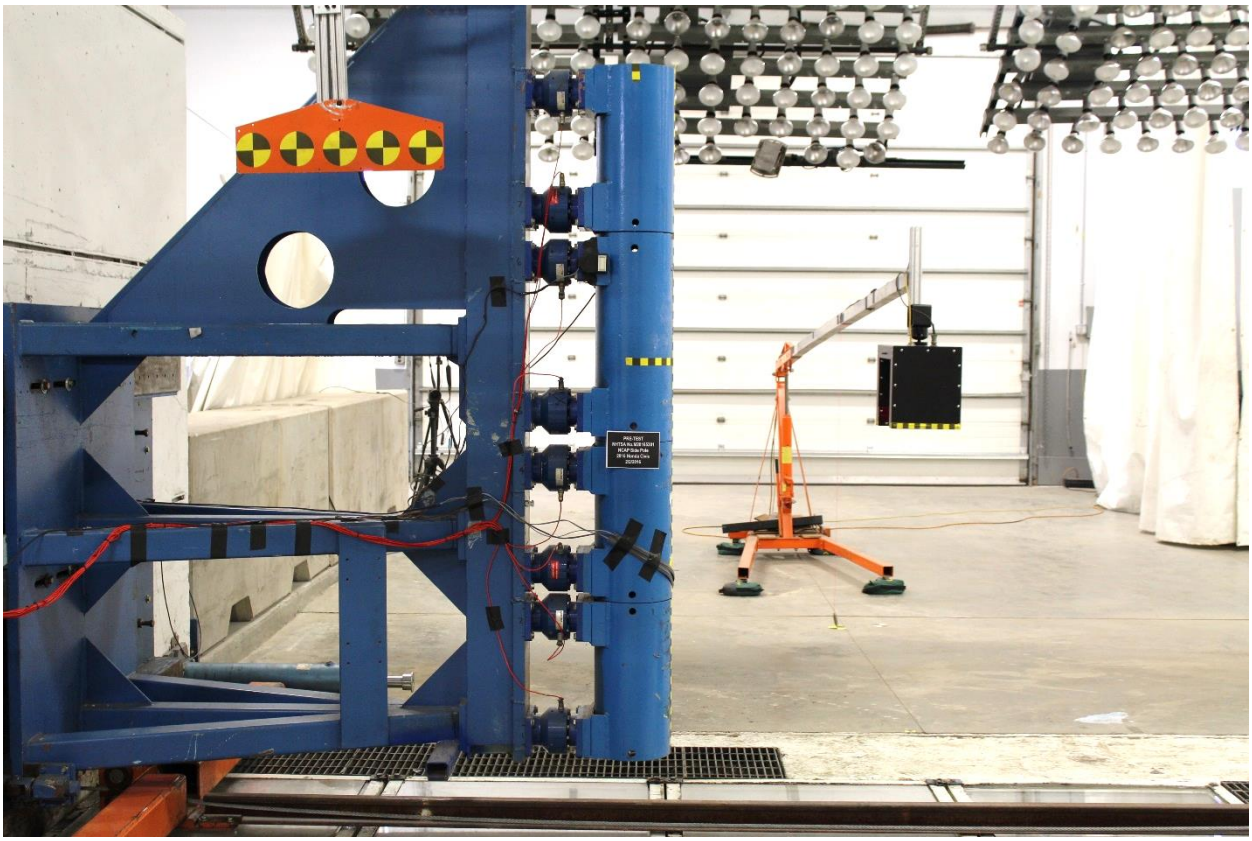


Figure A-59: Pre-Test Pole Barrier Side View

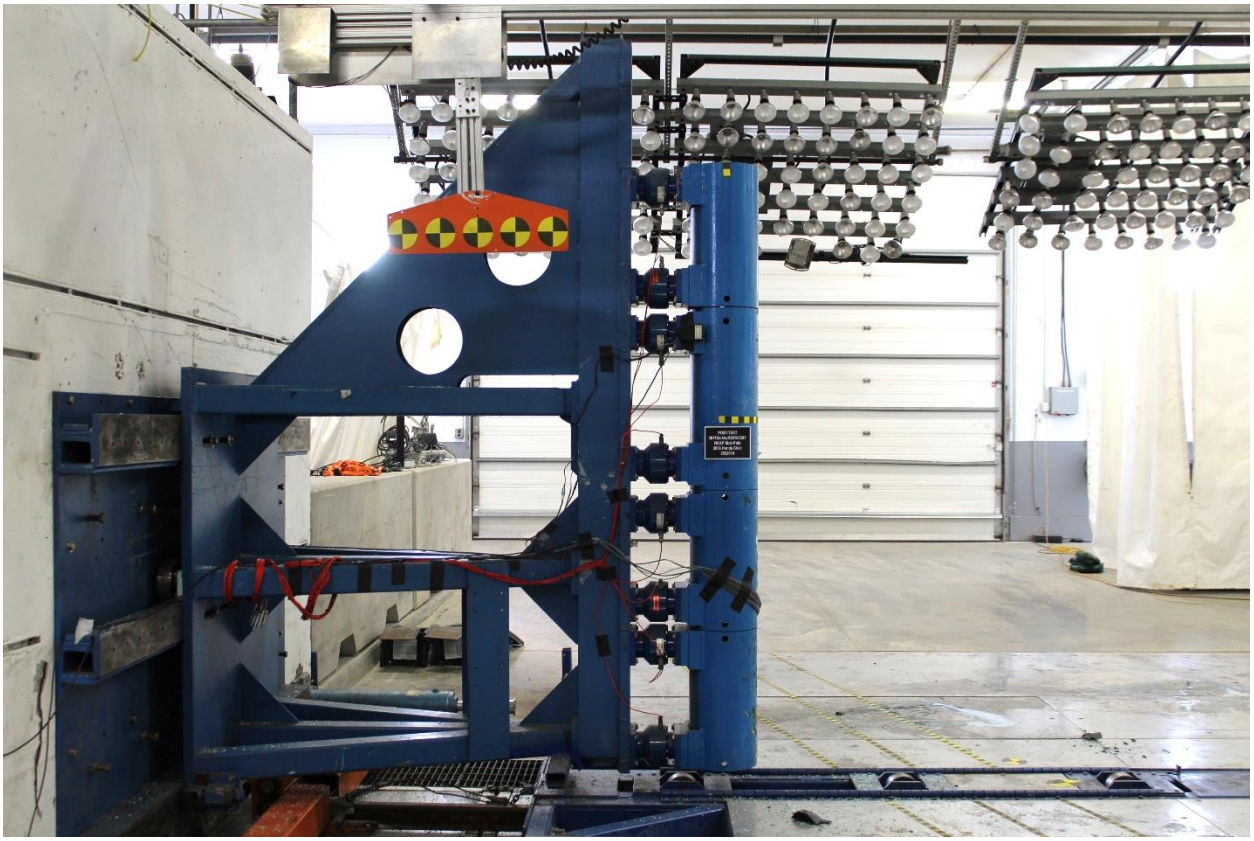


Figure A-60: Post-Test Pole Barrier Side View

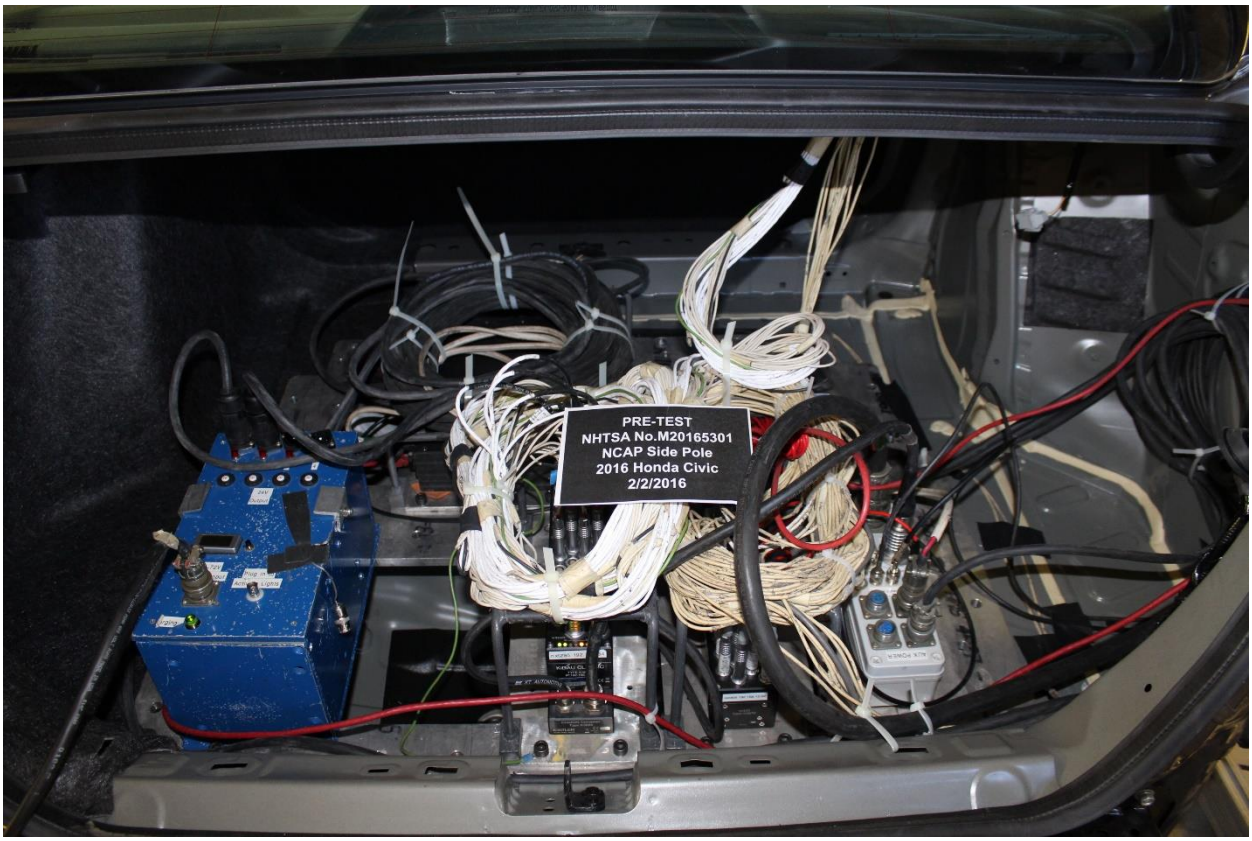


Figure A-61: Pre-Test Ballast View

Figure A-62: Post-Test Primary and Redundant Speed Trap Read-Out

Figure A-63: FMVSS No. 301 Static Rollover 0 Degrees

Figure A-64: FMVSS No. 301 Static Rollover 90 Degrees

Figure A-65: FMVSS No. 301 Static Rollover 180 Degrees

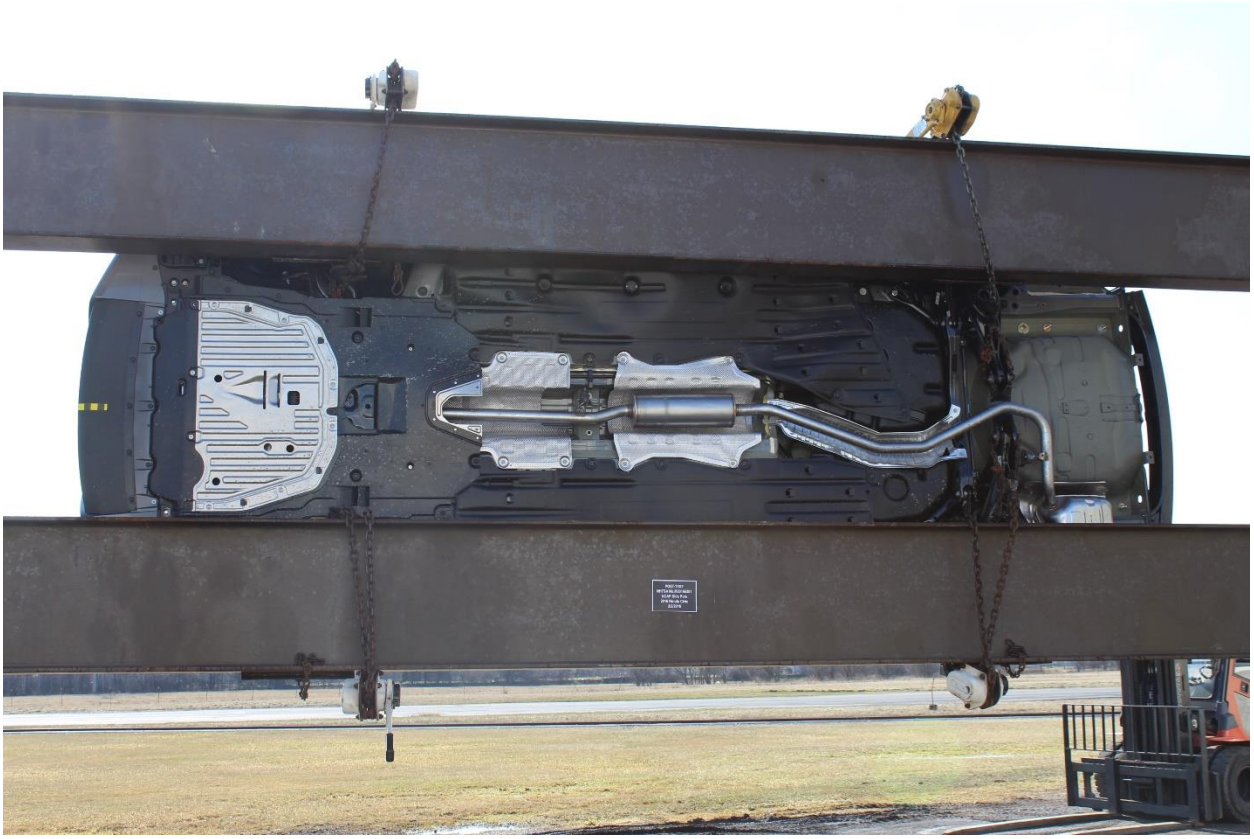


Figure A-66: FMVSS No. 301 Static Rollover 270 Degrees

Figure A-67: FMVSS No. 301 Static Rollover 360 Degrees

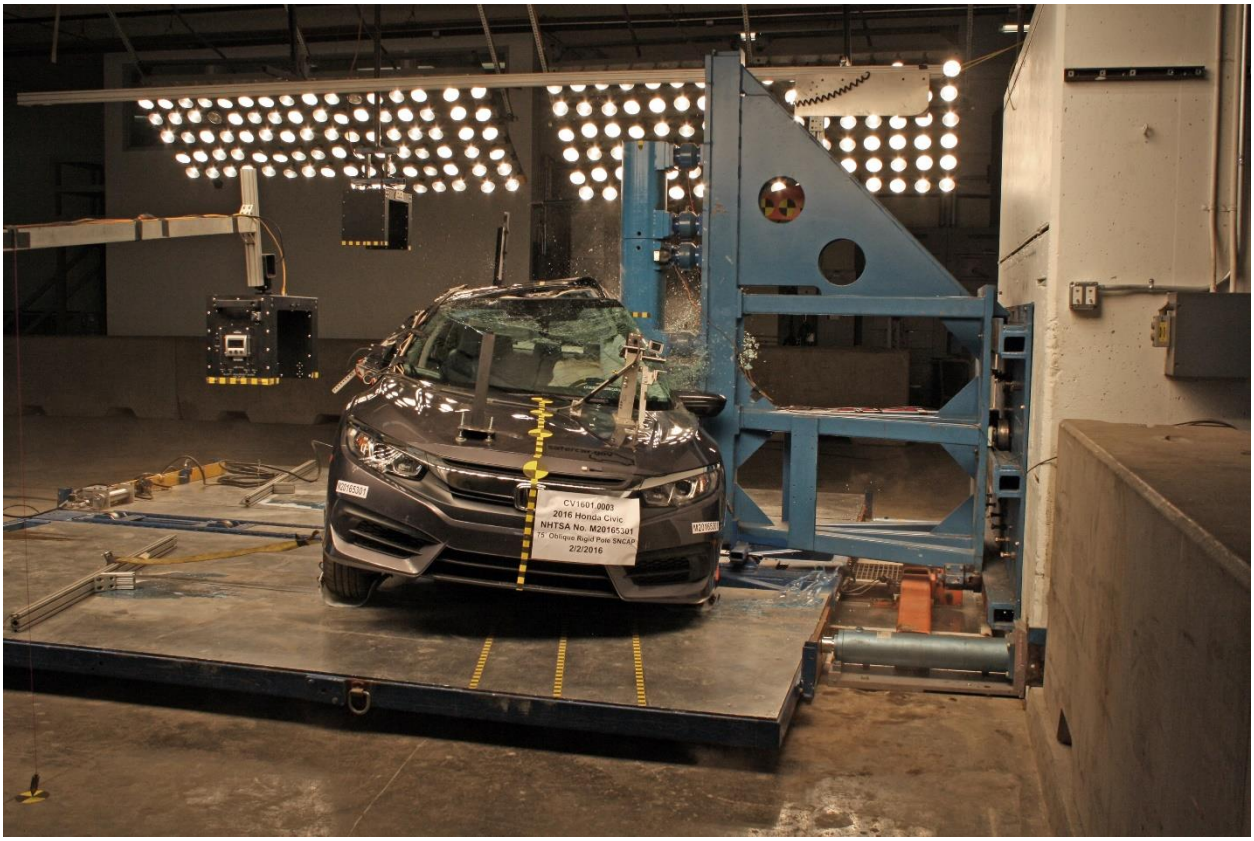


Figure A-68: Impact Event

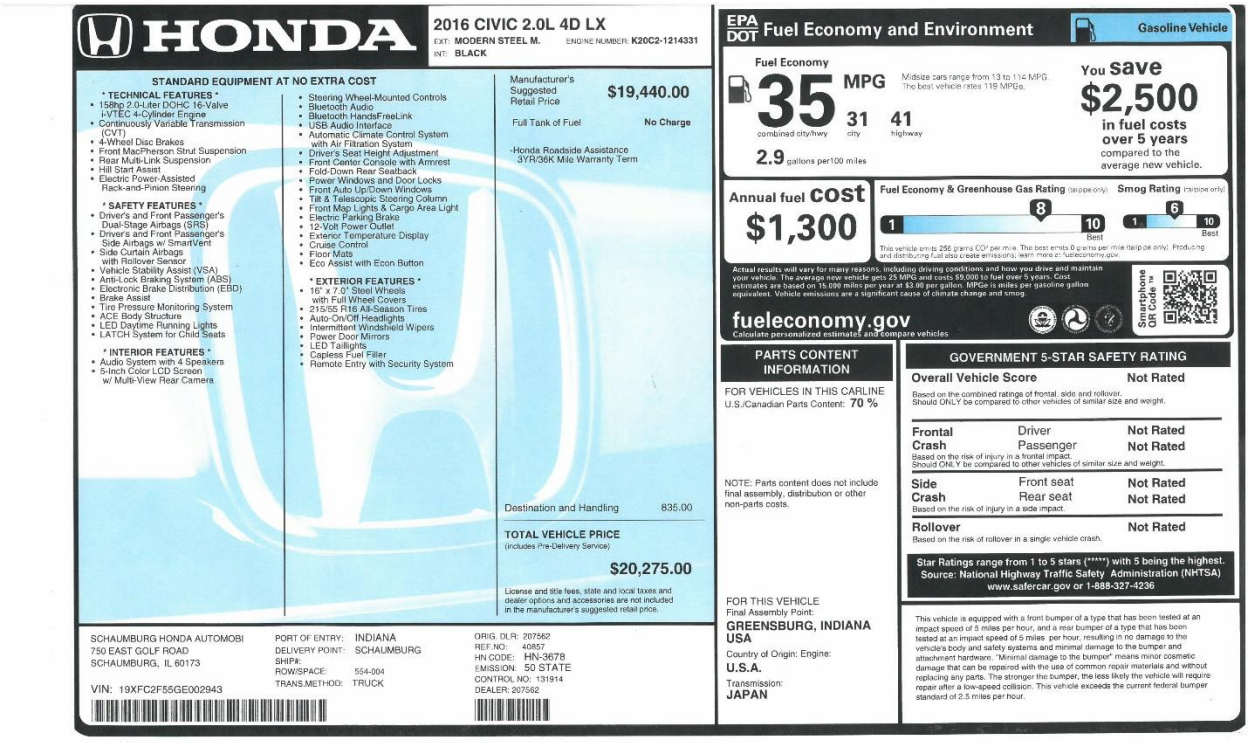
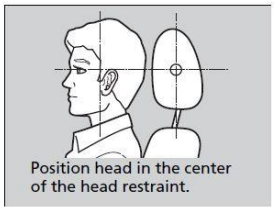


Figure A-69: Monroney Label

Head Restraints

Adjusting the Front Head Restraints

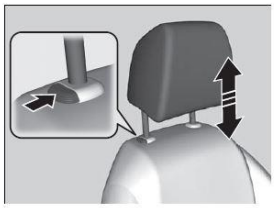

Position head in the center of the head restraint.

Your vehicle is equipped with head restraints in all seating positions.

Front head restraints are most effective for protection against whiplash and other rear-impact crash injuries when the center of the back of the occupant's head rests against the center of the restraint. The tops of the occupant's ears should be level with the center height of the restraint.

To raise the head restraint:
Pull it upward.

To lower the head restraint:
Push it down while pressing the release button.



Adjusting the Front Head Restraints

⚠WARNING

Improperly positioning head restraints reduces their effectiveness and increases the likelihood of serious injury in a crash.

Make sure head restraints are in place and positioned properly before driving.

In order for the head restraint system to work properly:
- Do not hang any items on the head restraints, or from the restraint legs.
- Do not place any object between an occupant and the seat-back.
- Install each restraint in its proper location.

Figure A-70: Head Restraint Use and Adjustment Information from Vehicle Owner's Manual

Figure A-71: Post-Test View of Shattered Vehicle Inner Door Panel (if applicable)

APPENDIX B

VEHICLE AND DUMMY RESPONSE DATA PLOTS

TABLE OF DATA PLOTS

Driver Dummy Instrumentation Plots

The following additional data for this test can be obtained from the Research and Development section of the NHTSA website. The website can be found at www.NHTSA.dot.gov.

Additional Driver Dummy Instrumentation Data

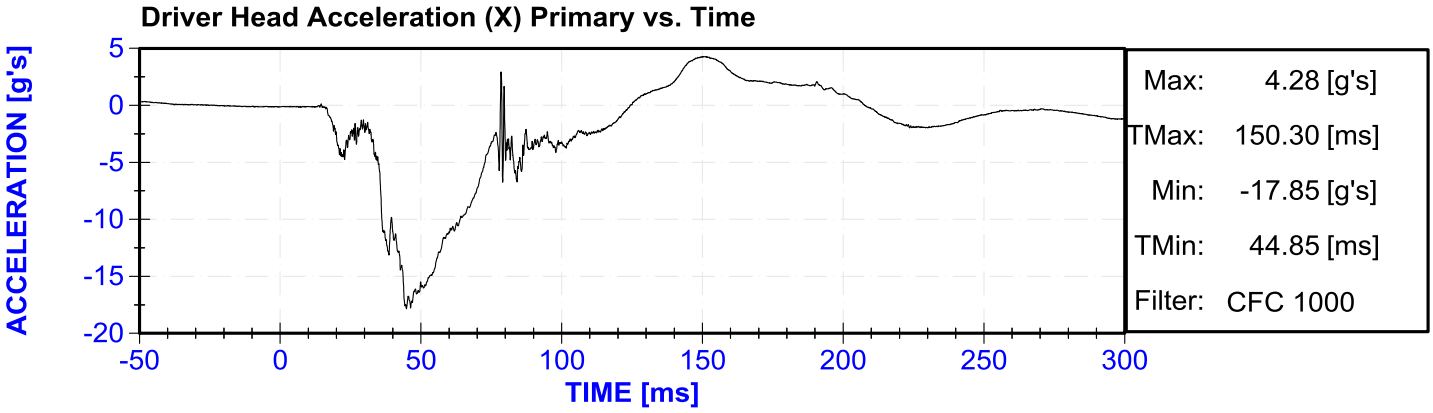
Driver Head Acceleration Redundant (X)
Driver Head Acceleration Redundant (Y)
Driver Head Acceleration Redundant (Z)
Driver Upper Thorax Rib Deflection (Y)
Driver Middle Thorax Rib Deflection (Y)
Driver Lower Thorax Rib Deflection (Y)
Driver Upper Abdomen Rib Deflection (Y)
Driver Lower Abdomen Rib Deflection (Y)

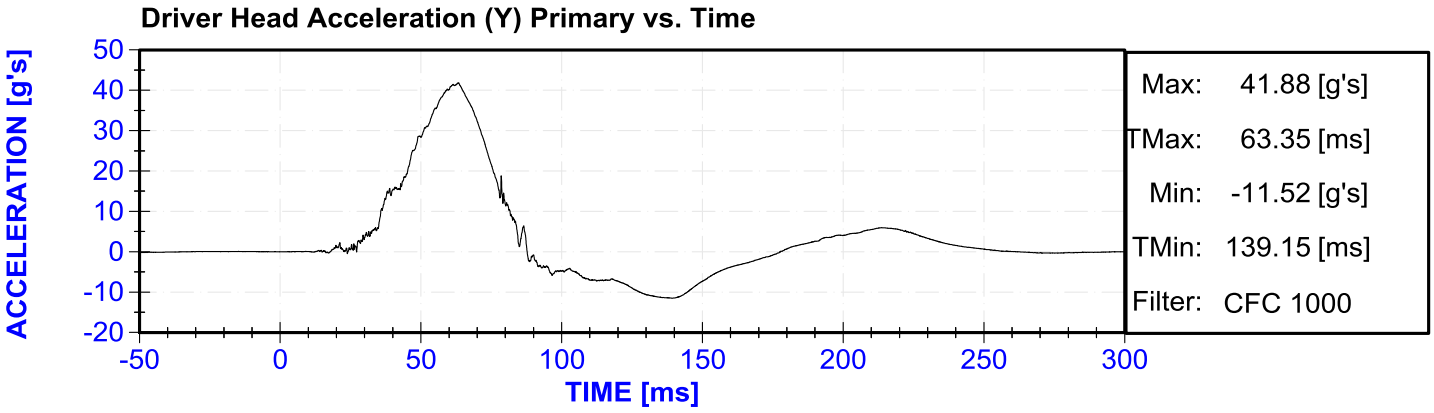
Vehicle Instrumentation Data

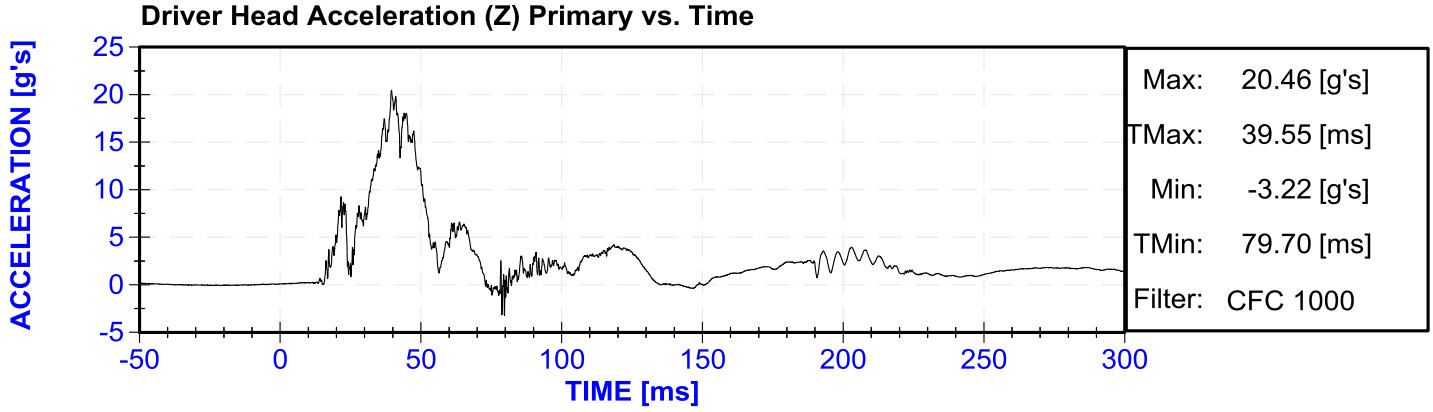
Vehicle Center of Gravity Acceleration (X)
Vehicle Center of Gravity Acceleration (Y)
Vehicle Center of Gravity Acceleration (Z)
Left Floor Sill Acceleration (Y)
Left A-Pillar Sill Acceleration (Y)
Left Lower A-Pillar Acceleration (Y)
Left Mid A-Pillar Acceleration (Y)
Left B-Pillar Sill Acceleration (Y)
Left Lower B-Pillar Acceleration (Y)
Left Mid B-Pillar Acceleration (Y)
Driver Seat Track at Dummy Hip Point Acceleration (Y)
Engine Top Acceleration (X)
Engine Top Acceleration (Y)
Firewall Center Acceleration (Y)
Right Roof at Vertical Impact Reference Line Acceleration (Y)
Right Sill at Vertical Impact Reference Line Acceleration (Y)
Rear Floorpan Behind Rear Axle at Centerline Acceleration (X)
Rear Floorpan Behind Rear Axle at Centerline Acceleration (Y)

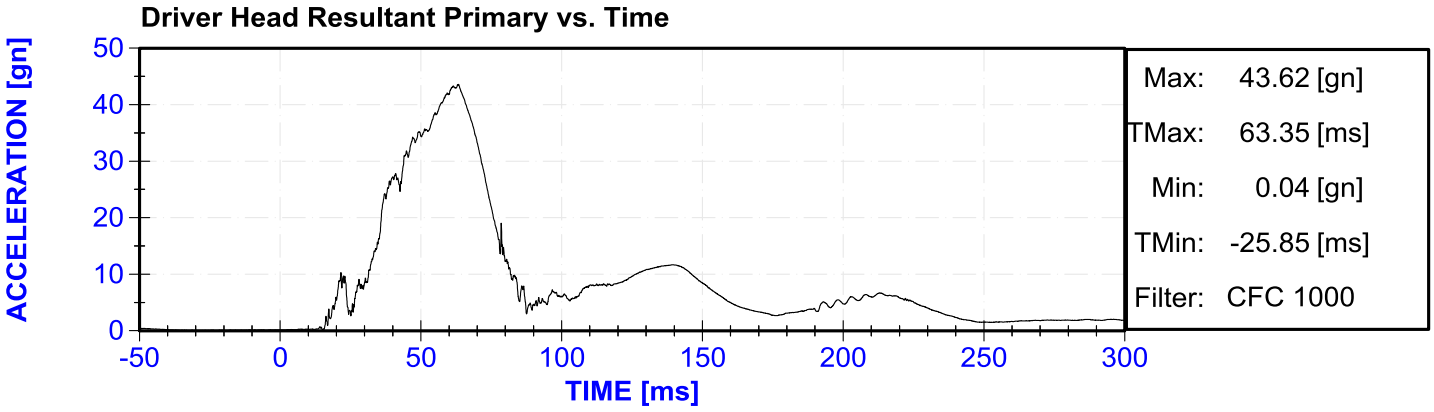
Pole Instrumentation Data

Load Cell Pole Barrier #1 Force (Y)
Load Cell Pole Barrier #2 Force (Y)
Load Cell Pole Barrier #3 Force (Y)
Load Cell Pole Barrier #4 Force (Y)
Load Cell Pole Barrier #5 Force (Y)
Load Cell Pole Barrier #6 Force (Y)
Load Cell Pole Barrier #7 Force (Y)
Load Cell Pole Barrier #8 Force (Y)

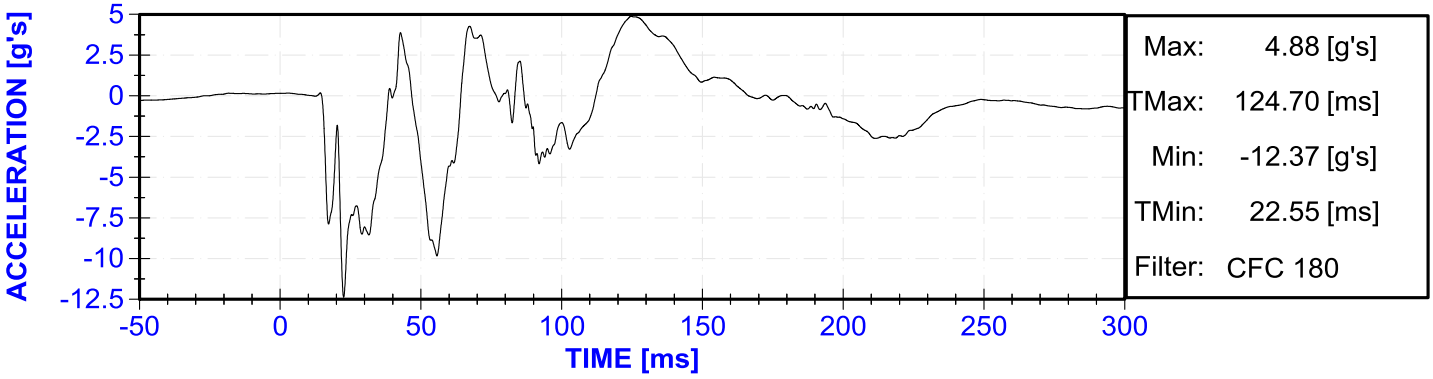

Driver Head Acceleration (X) Primary vs. Time
ACCELERATION [g's]
TIME [ms]
Max: 4.28 [g's]
TMax: 150.30 [ms]
Min: -17.85 [g's]
TMin: 44.85 [ms]
Filter: CFC 1000


Driver Head Acceleration (Y) Primary vs. Time
ACCELERATION [g's]
TIME [ms]
Max: 41.88 [g's]
TMax: 63.35 [ms]
Min: -11.52 [g's]
TMin: 139.15 [ms]
Filter: CFC 1000

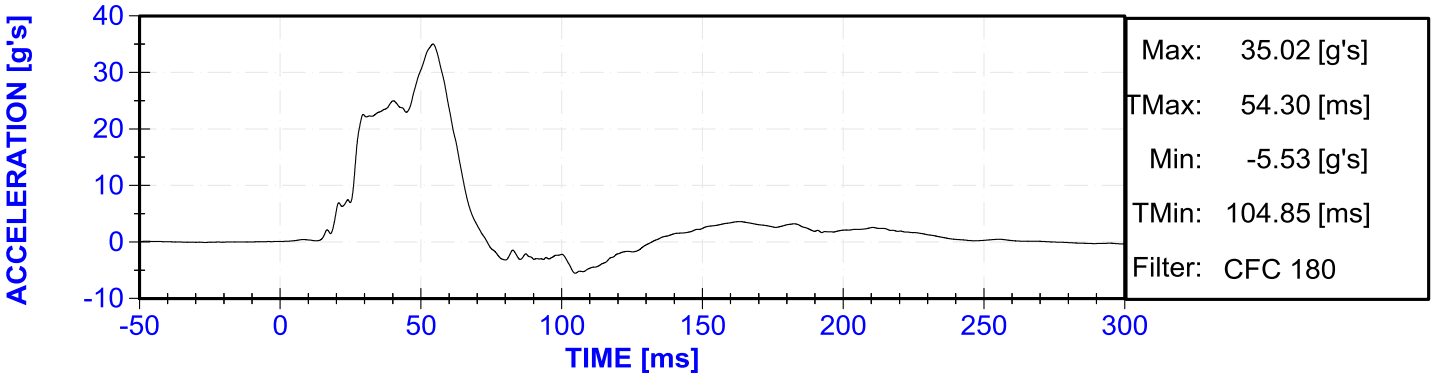

Driver Head Acceleration (Z) Primary vs. Time
ACCELERATION [g's]
TIME [ms]
Max: 20.46 [g's]
TMax: 39.55 [ms]
Min: -3.22 [g's]
TMin: 79.70 [ms]
Filter: CFC 1000


Driver Head Resultant Primary vs. Time
ACCELERATION [gn]
TIME [ms]
Max: 43.62 [gn]
TMax: 63.35 [ms]
Min: 0.04 [gn]
TMin: -25.85 [ms]
Filter: CFC 1000

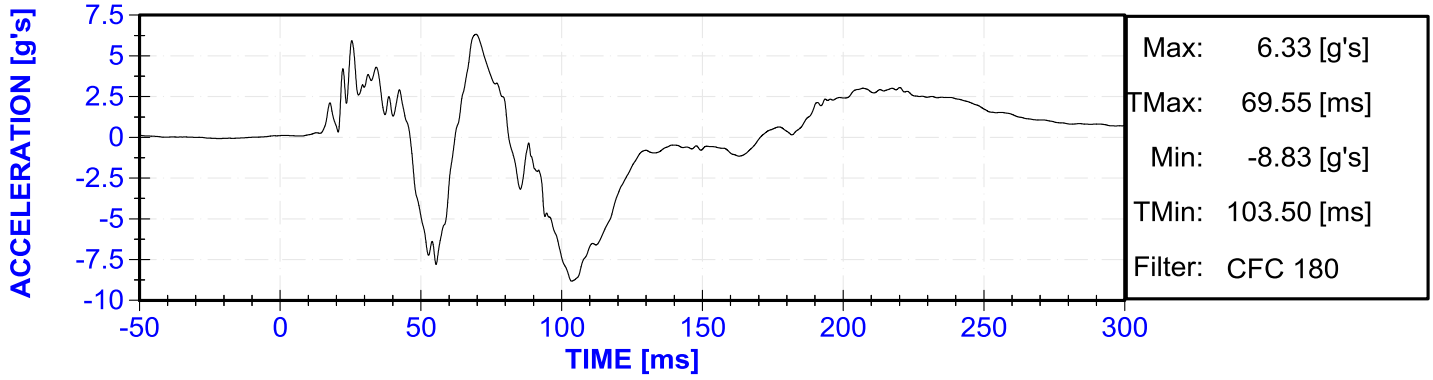
Driver Lower Spine T12 Acceleration (X) vs. Time



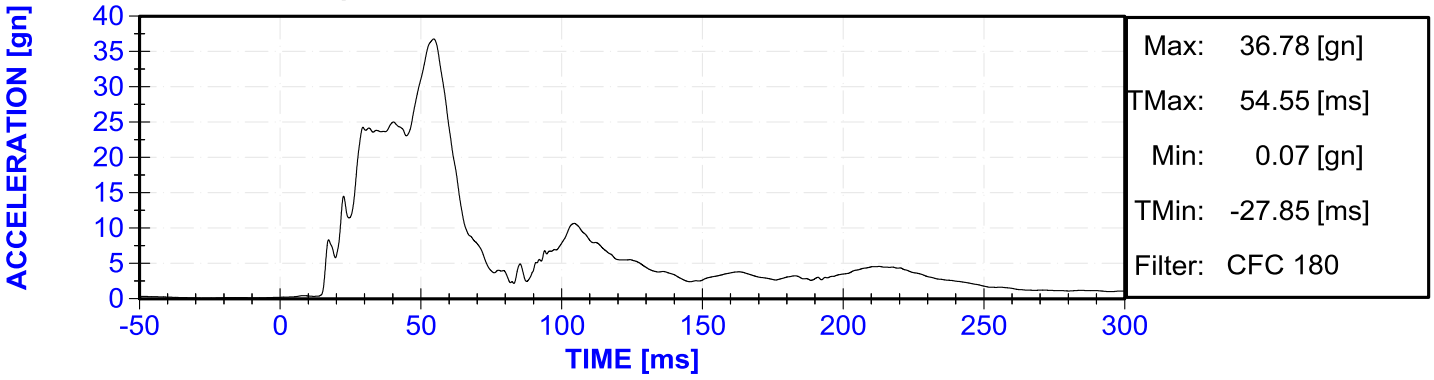
Driver Lower Spine T12 Acceleration (Y) vs. Time



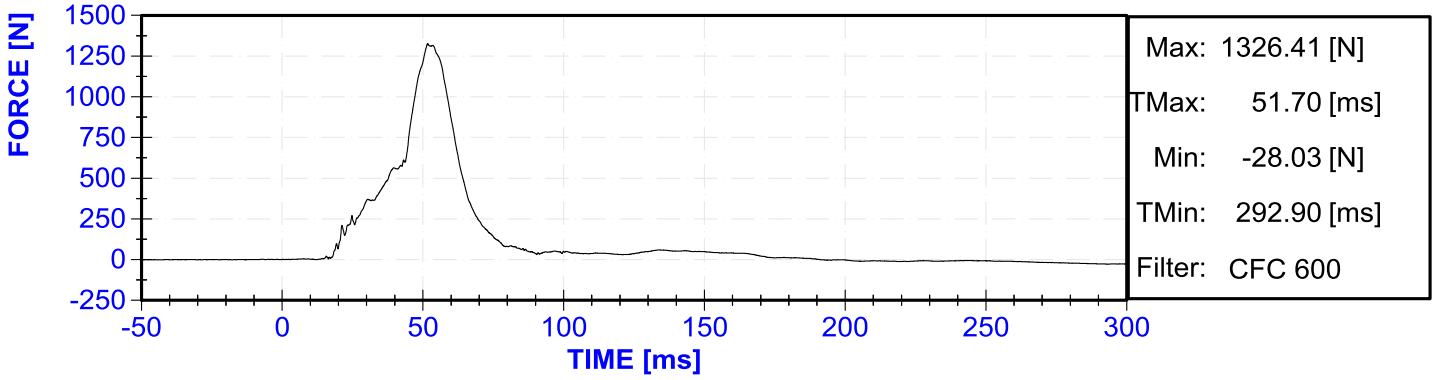
Driver Lower Spine T12 Acceleration (Z) vs. Time



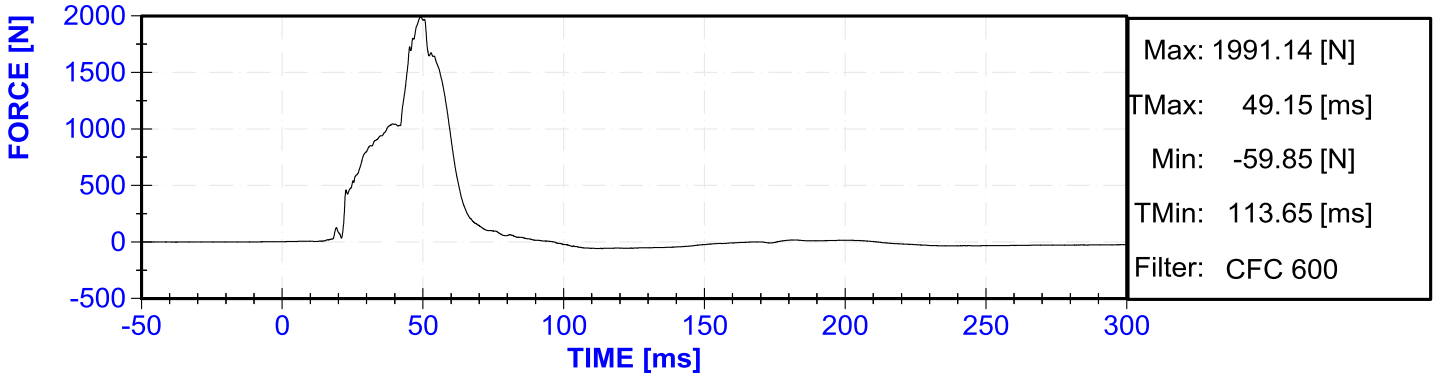
Driver Lower Spine T12 Resultant Acceleration vs. Time



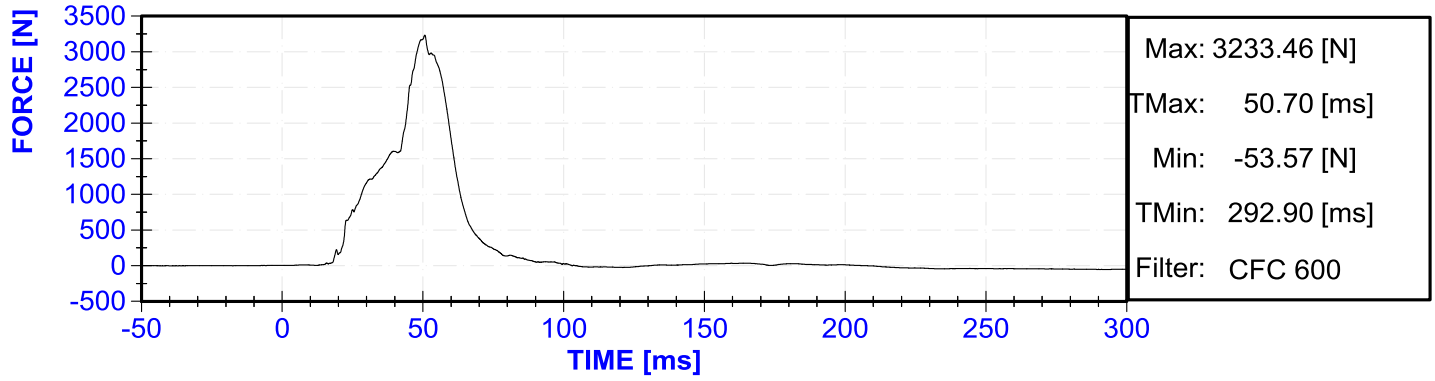
Driver Iliac Wing Force on Impact Side (Y) vs. Time



Driver Acetabulum Force on Impact Side (Y) vs. Time



Driver Total Pelvis Force on Impact Side (Y) vs. Time



APPENDIX C

DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA

CALIBRATION TEST RESULTS

PRE-TEST

SID-IIS 5TH PERCENTILE FEMALE - DRIVER ATD

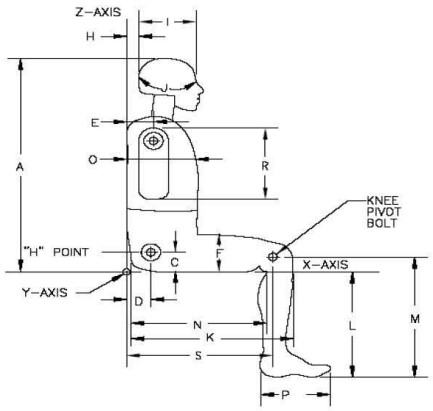
SERIAL NO: 303

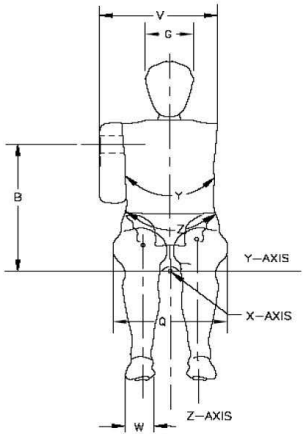
(CONFIGURED FOR LEFT SIDE IMPACT)

External Measurements - SID-IIs

Technician: M. Geesey Date: 12/16/2015

Dummy Serial Number: 303





Symbol	Description	Specification (mm)		Result (mm)	Pass/Fail
A	Sitting Height	772	788	780	Pass
B	Shoulder Pivot Height	437	453	447	Pass
C	H-point Height	79	89	86	Pass
D	H-point from seatback	141	151	146	Pass
E	Shoulder Pivot from Backline	97	107	103	Pass
F	Thigh Clearance	119	135	128	Pass
G	Head Breadth	140	148	144	Pass
H	Head Back from Backline	40	46	43	Pass
I	Head Depth	178	188	180	Pass
J	Head Circumference	541	551	546	Pass
K	Buttock to Knee Length	514	540	532	Pass
L	Popliteal Height	343	369	357	Pass
M	Knee Pivot to floor height	392	409	404	Pass
N	Buttock Popliteal Length	416	442	437	Pass
O	Chest Depth w/o jacket	195	211	204	Pass
P	Foot Length	216	232	221	Pass
Q	Hip Breadth (w/pelvic plugs)	313	323	317	Pass
R	Arm Length	249	259	253	Pass
S	Knee Joint to seatback	477	493	486	Pass
V	Shoulder Width	341	357	350	Pass
W	Foot Width	78	94	86	Pass
Y	Chest Circumference w/jacket	851	881	870	Pass
Z	Waist Circumference	761	791	771	Pass

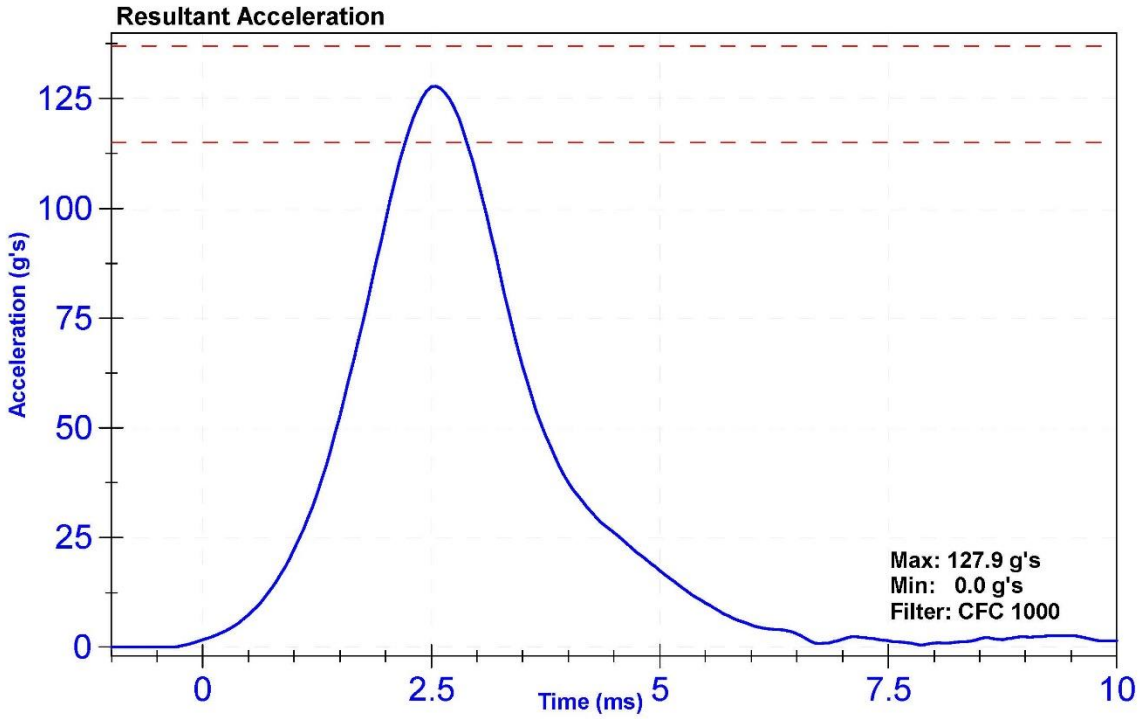
ATD Manufacturer	FTSS	Test Technician	M. Geesey
ATD Serial Number	303	Laboratory Supervisor	M. Goehle

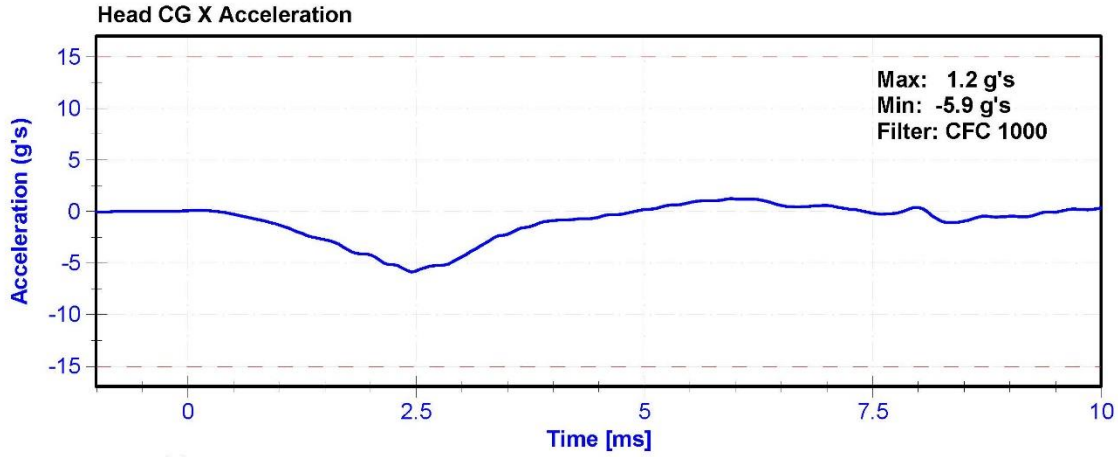
Results

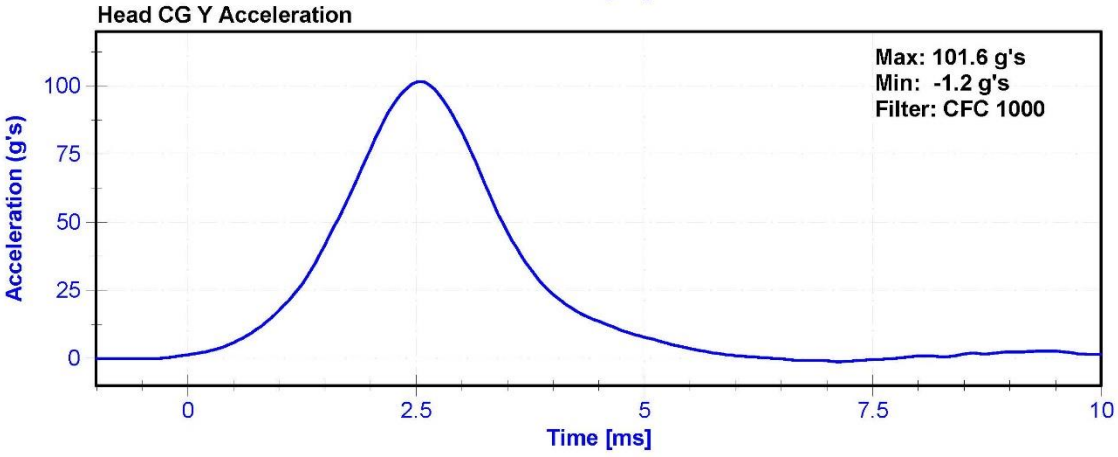
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.2	Pass
Humidity	10	70	%	32	Pass
Resultant Acceleration	115	137	g's	127.9	Pass
Oscillation	0	15	%	2.1	Pass
Fore-Aft Acceleration	-15	15	g's	-5.9	Pass

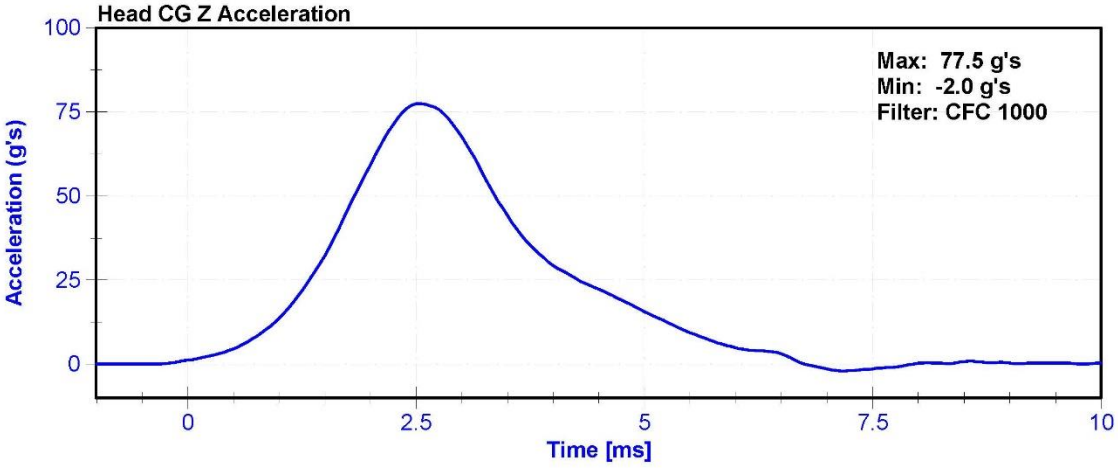
Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
X Accelerometer	ENDEVCO 7264	AC-P83420	10/16/2015	4/15/2016
Y Accelerometer	ENDEVCO 7264	AC-P52040	10/14/2015	4/13/2016
Z Accelerometer	ENDEVCO 7264CT	AC-P58737	10/14/2015	4/13/2016




Head CG X Acceleration
Max: 1.2 g's
Min: -5.9 g's
Filter: CFC 1000
Acceleration (g's)
15
10
5
0
-5
-10
-15
0
2.5
5
7.5
10
Time [ms]


Head CG Y Acceleration
Max: 101.6 g's
Min: -1.2 g's
Filter: CFC 1000
Acceleration (g's)
100
75
50
25
0
0
2.5
5
7.5
10
Time [ms]


Head CG Z Acceleration
Max: 77.5 g's
Min: -2.0 g's
Filter: CFC 1000
Acceleration (g's)
100
75
50
25
0
0
2.5
5
7.5
10
Time [ms]

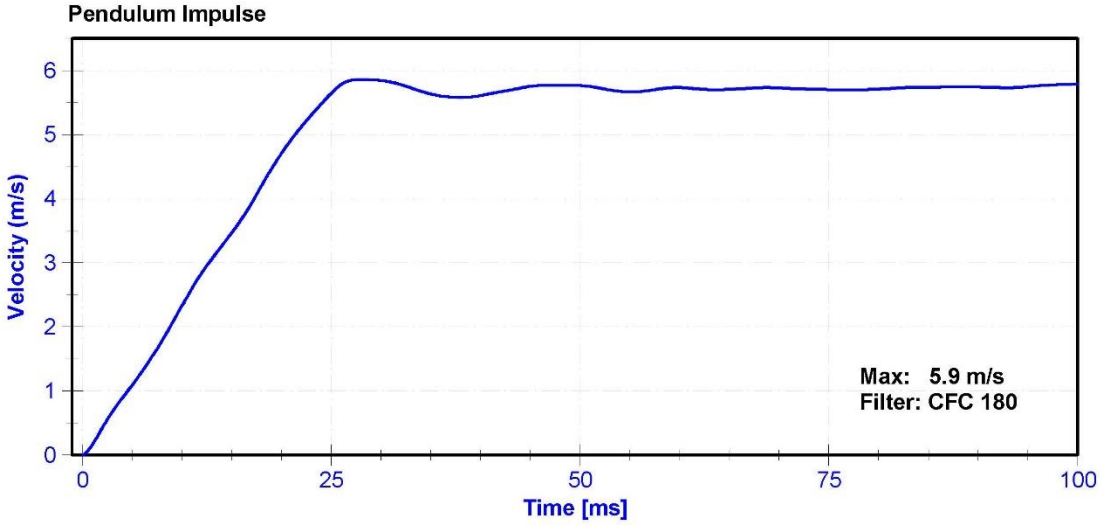
ATD Manufacturer	FTSS	Test Technician	M. Geesey
ATD Serial Number	303	Laboratory Supervisor	M. Goehle

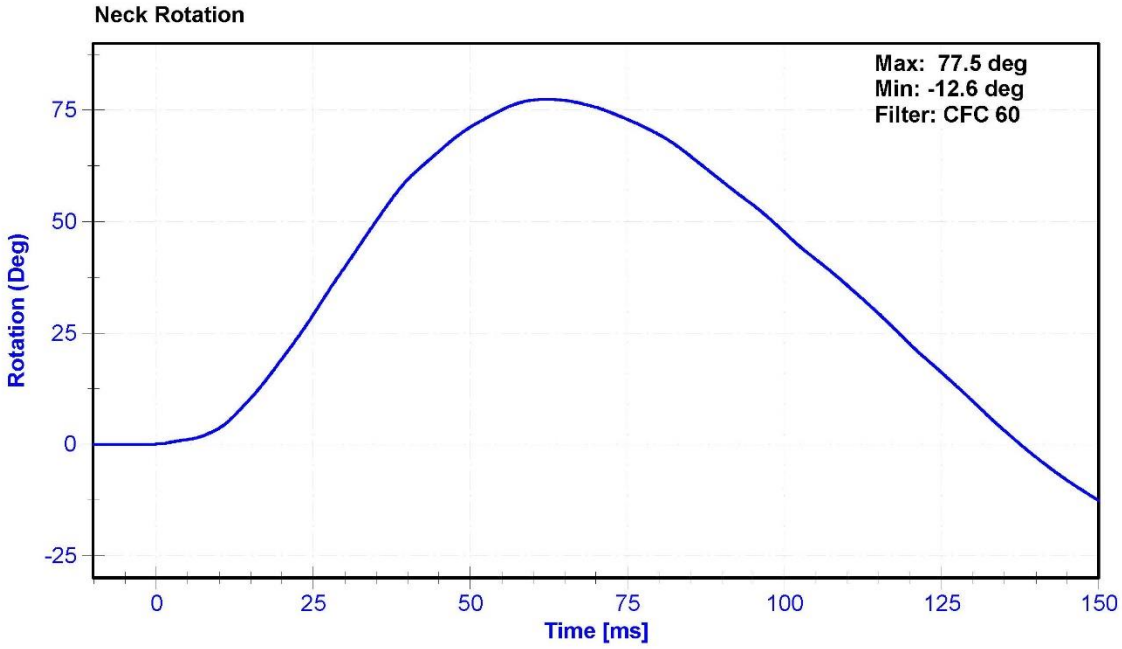
Results

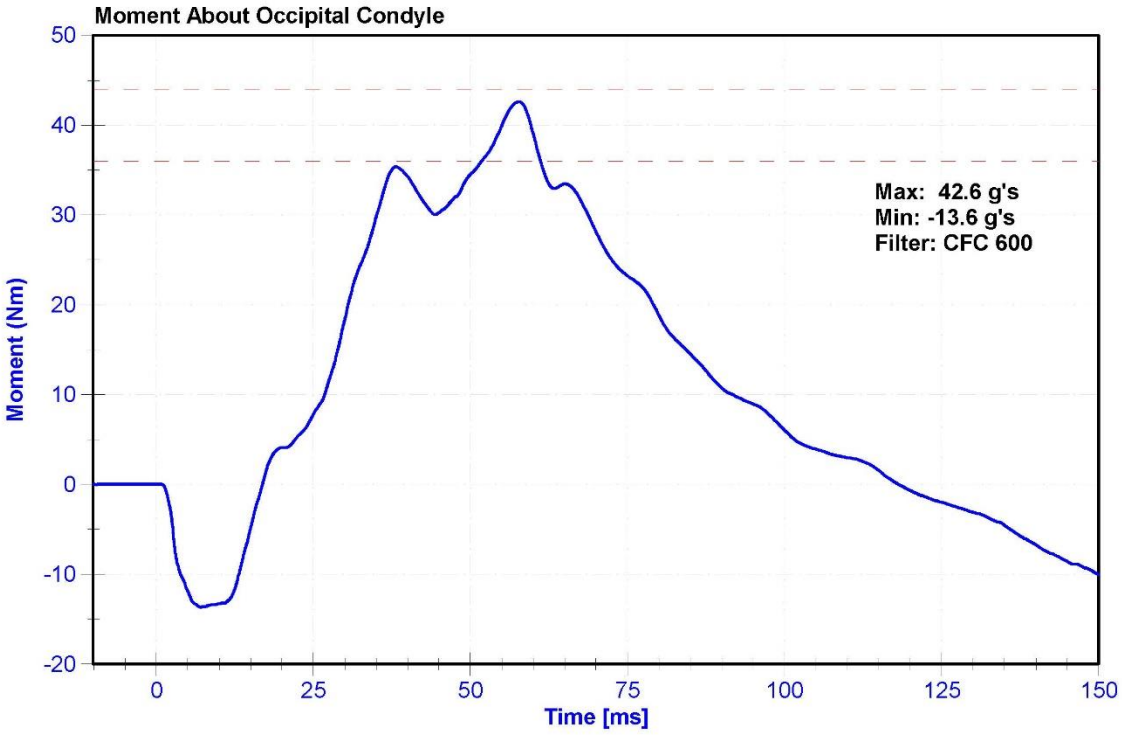
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.1	Pass
Humidity	10	70	%	37	Pass
Velocity	5.51	5.63	m/s	5.583	Pass
Pendulum Impulse at 10ms	2.2	2.8	m/s	2.33	Pass
Pendulum Impulse at 15ms	3.3	4.1	m/s	3.47	Pass
Pendulum Impulse at 20ms	4.4	5.4	m/s	4.71	Pass
Pendulum Impulse at 25ms	5.4	6.1	m/s	5.65	Pass
Pendulum Impulse from 25 to 100ms	5.5	6.2	m/s	5.86	Pass
Neck Rotation	71	81	deg	77.5	Pass
Time at Maximum Rotation	50	70	ms	62.1	Pass
Moment about the OC	36	44	Nm	42.6	Pass
Moment Decay to 0 Nm	102	126	ms	118.2	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	ENDEVCO 7231CT	AC-AH5F3	5/7/2015	5/6/2016
Pendulum Potentiometer	Denton 78051-342	DS-184Pend	9/24/2015	9/23/2016
Condyle Potentiometer	Denton 78051-342	DS-185Pend	9/25/2015	9/24/2016
Upper Neck Load Cell	Denton 1716A	LC-2019Fy	6/29/2015	6/28/2016




Neck Rotation
Max: 77.5 deg
Min: -12.6 deg
Filter: CFC 60
Rotation (Deg)
75
50
25
0
-25
0
25
50
75
100
125
150
Time [ms]


Moment About Occipital Condyle
Max: 42.6 g's
Min: -13.6 g's
Filter: CFC 600
Moment (Nm)
50
40
30
20
10
0
-10
-20
0
25
50
75
100
125
150
Time [ms]

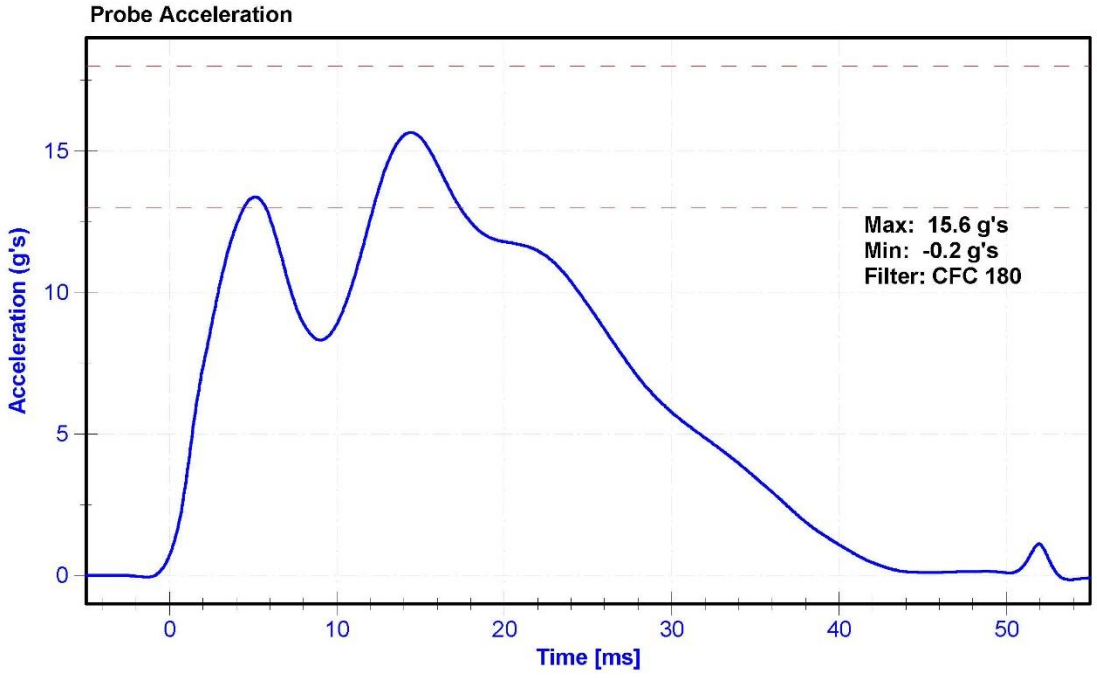
ATD Manufacturer	FTSS	Test Technician	M. Geesey
ATD Serial Number	303	Laboratory Supervisor	M. Goehle

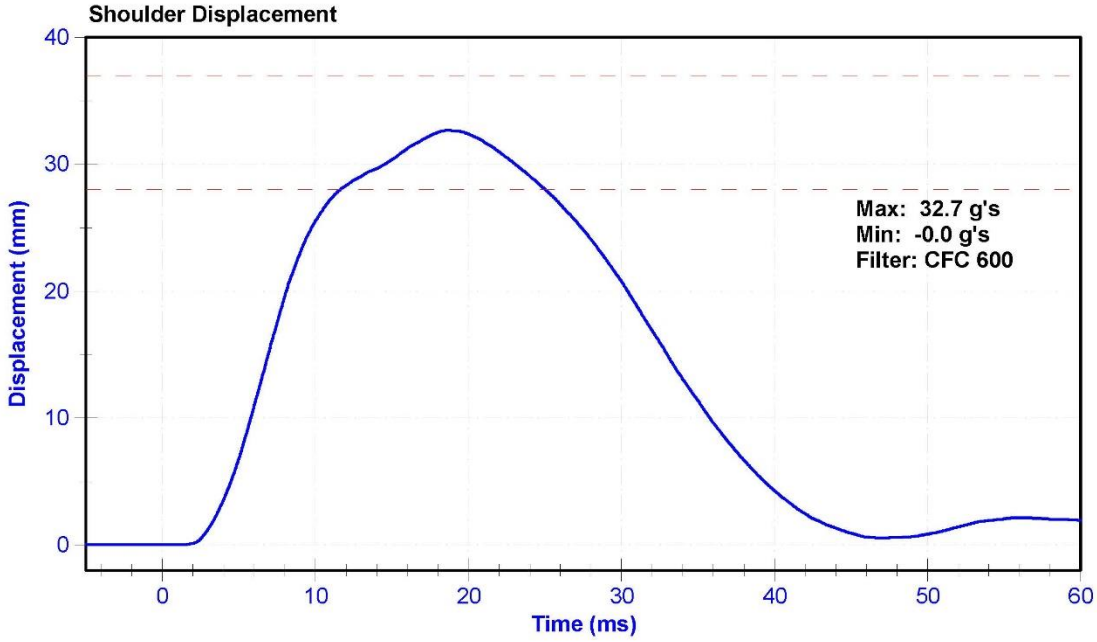
Results

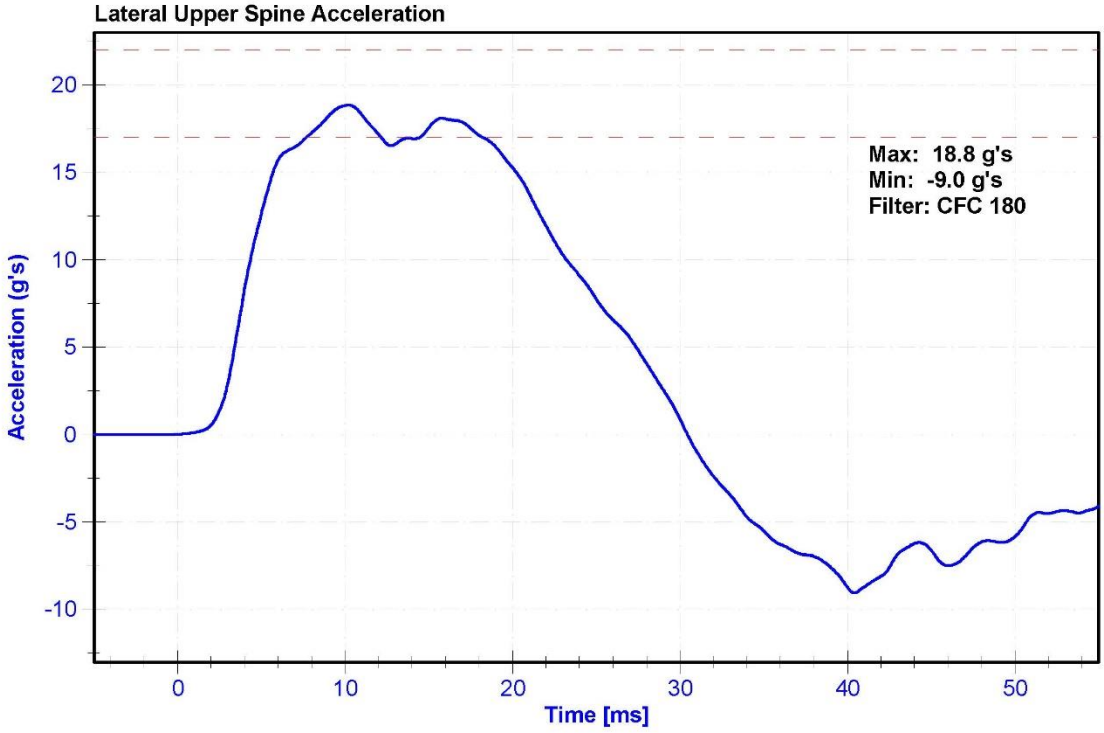
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.7	Pass
Humidity	10	70	%	39.4	Pass
Velocity	4.2	4.4	m/s	4.35	Pass
Probe Acceleration	13	18	g's	15.6	Pass
Shoulder Deflection	28	37	mm	32.7	Pass
Lateral Upper Spine Acceleration	17	22	g's	18.8	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	ENDEVCO 7231CT	AC-C14972	8/13/2015	2/11/2016
Shoulder Potentiometer	Servo 08TC1-3725	DS-008GFE	10/19/2015	10/18/2016
Upper Spine Y Accelerometer	ENDEVCO 7264CT	AC-P63315	10/19/2015	4/18/2016




Shoulder Displacement
Displacement (mm)
Time (ms)
Max: 32.7 g's
Min: -0.0 g's
Filter: CFC 600


Lateral Upper Spine Acceleration
Acceleration (g's)
Time [ms]
Max: 18.8 g's
Min: -9.0 g's
Filter: CFC 180

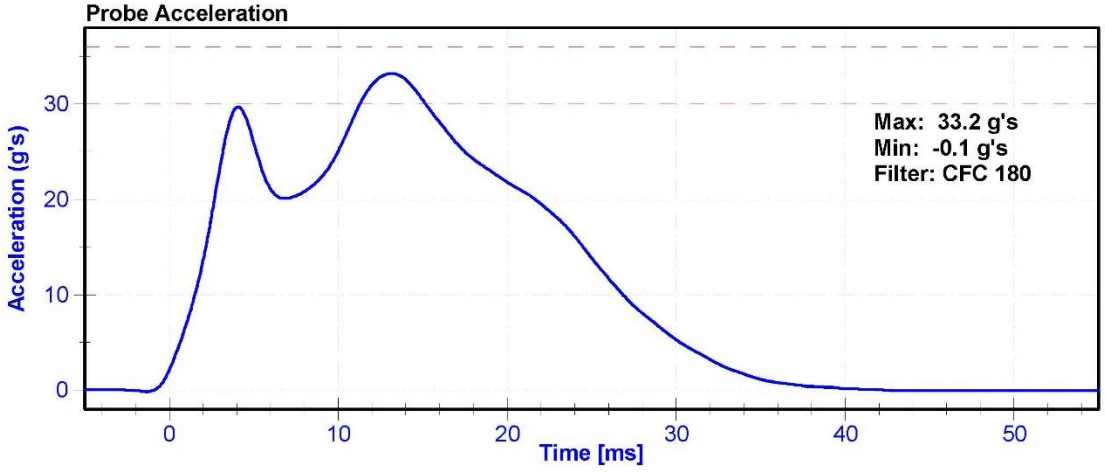
ATD Manufacturer	FTSS	Test Technician	M. Geesey
ATD Serial Number	303	Laboratory Supervisor	M. Goehle

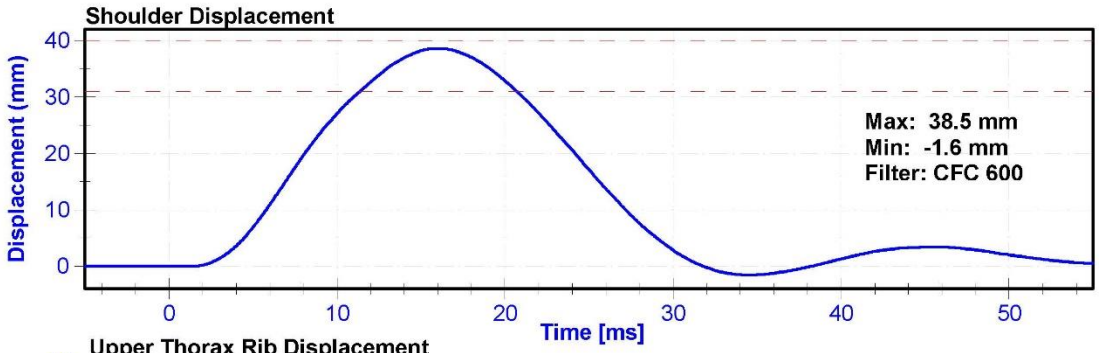
Results

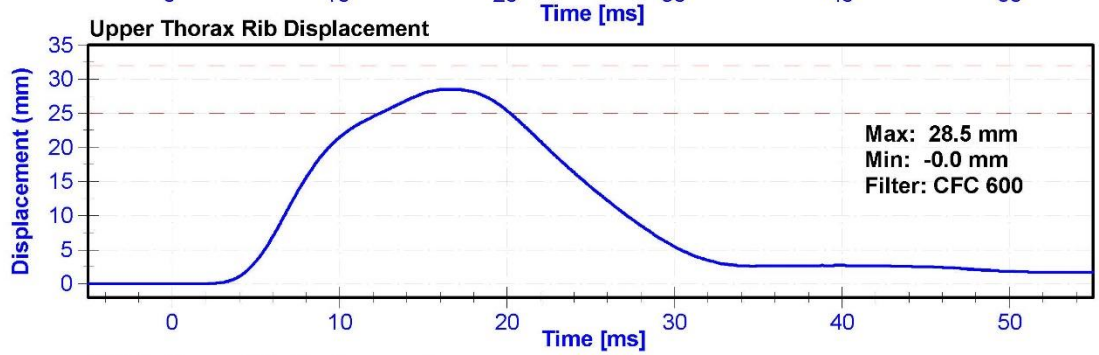
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.7	Pass
Humidity	10	70	%	40.1	Pass
Velocity	6.6	6.8	m/s	6.67	Pass
Probe Acceleration after 5 ms	30	36	g's	33.2	Pass
Lateral Upper Spine Acceleration	34	43	g's	39.7	Pass
Lateral Lower Spine Acceleration	29	37	g's	34.8	Pass
Shoulder Deflection	31	40	mm	38.5	Pass
Upper Thorax Rib Deflection	25	32	mm	28.5	Pass
Mid Thorax Rib Deflection	30	36	mm	32.2	Pass
Lower Thorax Rib Deflection	32	38	mm	33.6	Pass

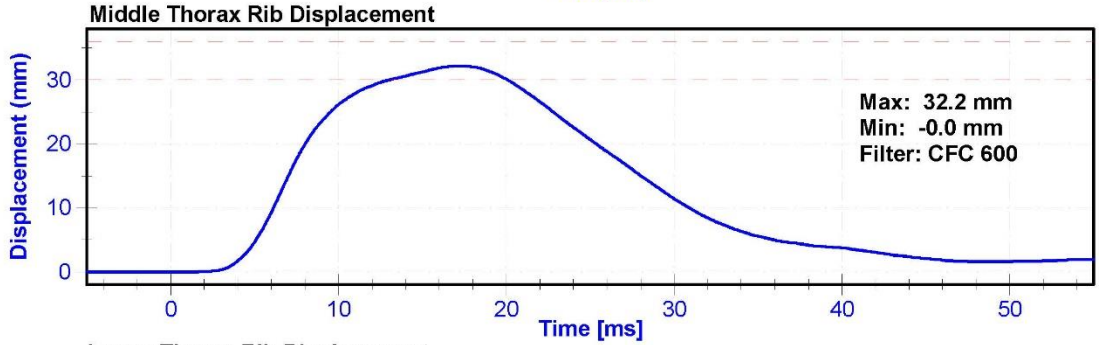
Transducer Calibrations

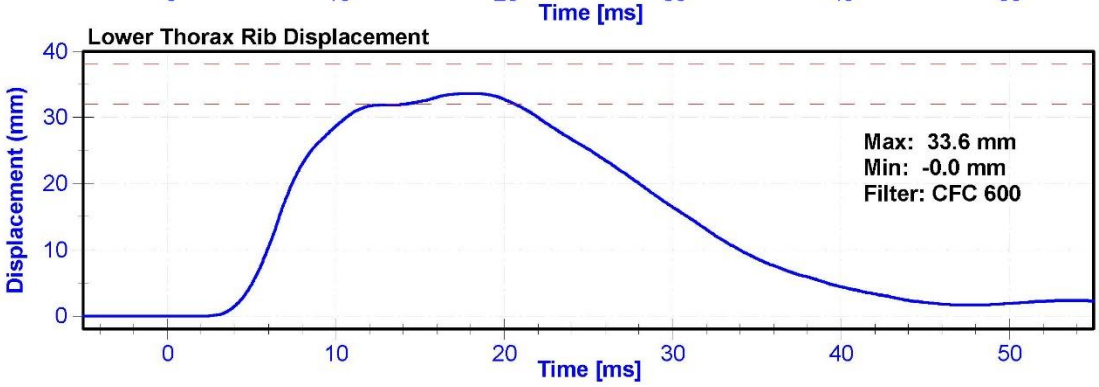
Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	ENDEVCO 7231CT	AC-C14972	8/13/2015	2/11/2016
Upper Spine T1 Y Accelerometer	ENDEVCO 7264CT	AC-P63315	10/19/2015	4/18/2016
Upper Spine T12 Y Accelerometer	ENDEVCO 7264CT	AC-P51974	10/19/2015	4/18/2016
Shoulder Potentiometer	Servo 08TC1-3725	DS-008GFE	10/19/2015	10/18/2016
Upper Thorax Rib Potentiometer	Servo 08CT1-3725	DS-1199GFE	10/19/2015	10/18/2016
Middle Thorax Rib Potentiometer	Servo 08CT1-3725	DS-1246GFE	10/19/2015	10/18/2016
Lower Thorax Rib Potentiometer	Servo 08CT1-3725	DS-1256GFE	10/19/2015	10/18/2016

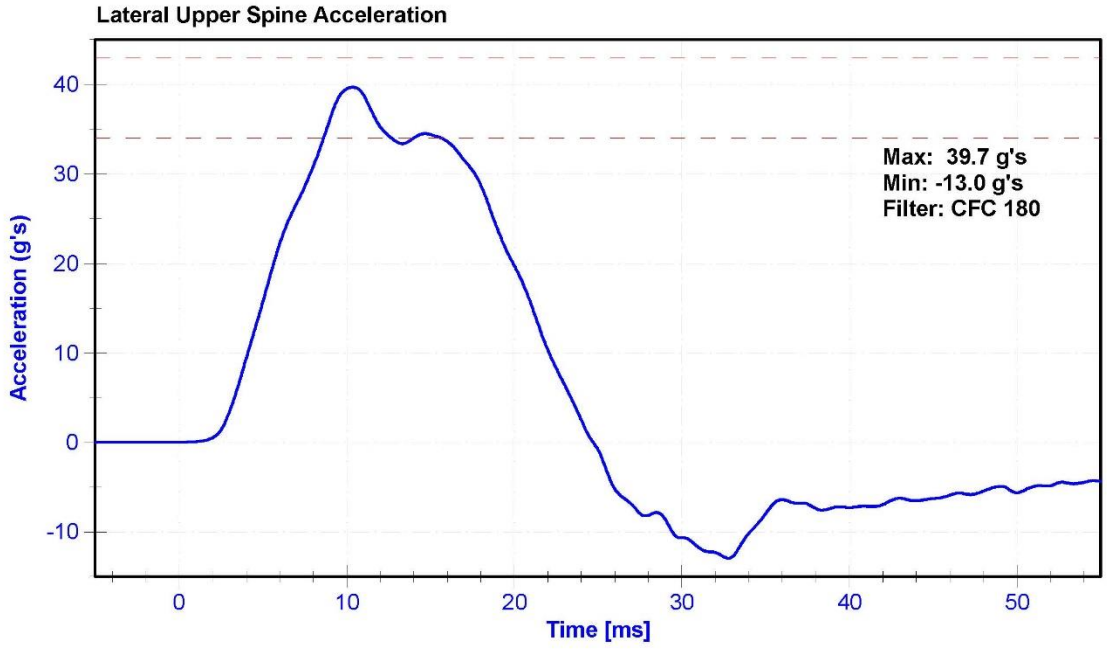


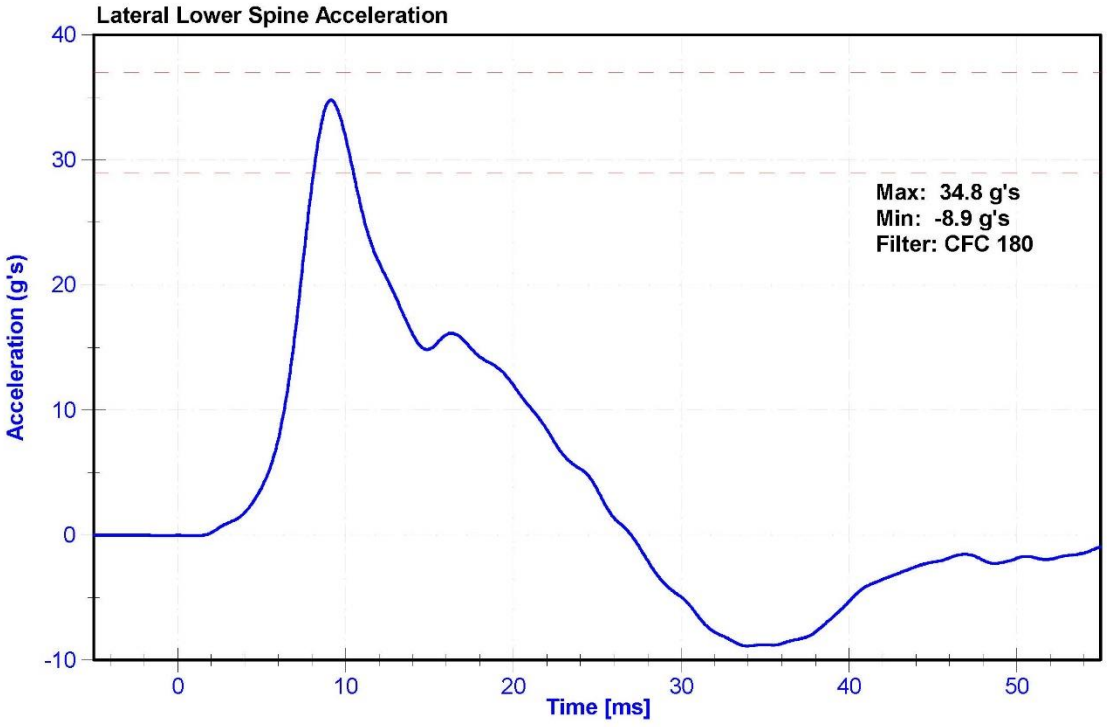

Shoulder Displacement
Displacement (mm)
Time [ms]
Max: 38.5 mm
Min: -1.6 mm
Filter: CFC 600


Upper Thorax Rib Displacement
Displacement (mm)
Time [ms]
Max: 28.5 mm
Min: -0.0 mm
Filter: CFC 600


Middle Thorax Rib Displacement
Displacement (mm)
Time [ms]
Max: 32.2 mm
Min: -0.0 mm
Filter: CFC 600


Lower Thorax Rib Displacement
Displacement (mm)
Time [ms]
Max: 33.6 mm
Min: -0.0 mm
Filter: CFC 600


Lateral Upper Spine Acceleration
Max: 39.7 g's
Min: -13.0 g's
Filter: CFC 180
Acceleration (g's)
Time [ms]
40
30
20
10
0
-10
0
10
20
30
40
50


Lateral Lower Spine Acceleration
Max: 34.8 g's
Min: -8.9 g's
Filter: CFC 180
Acceleration (g's)
Time [ms]
40
30
20
10
0
-10
0
10
20
30
40
50

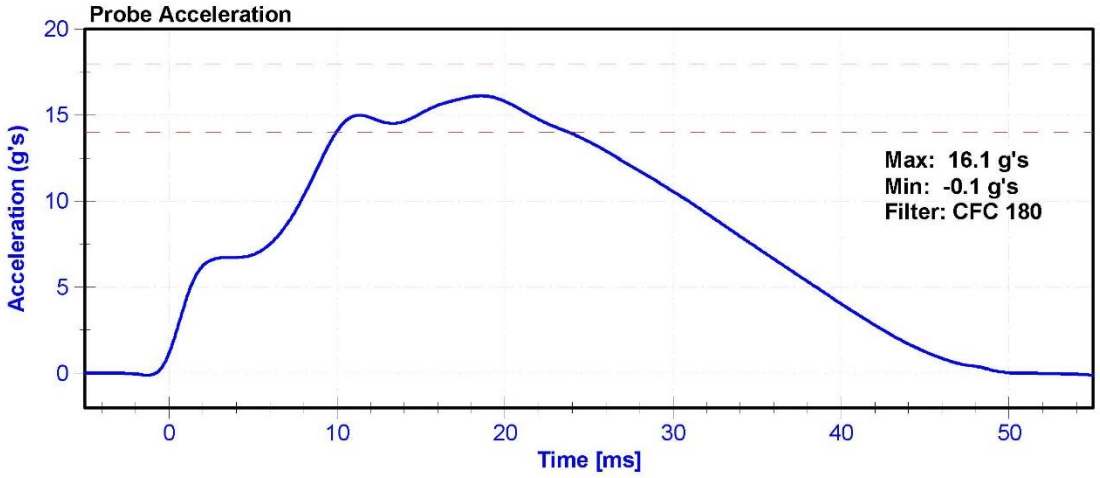
ATD Manufacturer	FTSS	Test Technician	M. Geesey
ATD Serial Number	303	Laboratory Supervisor	M. Goehle

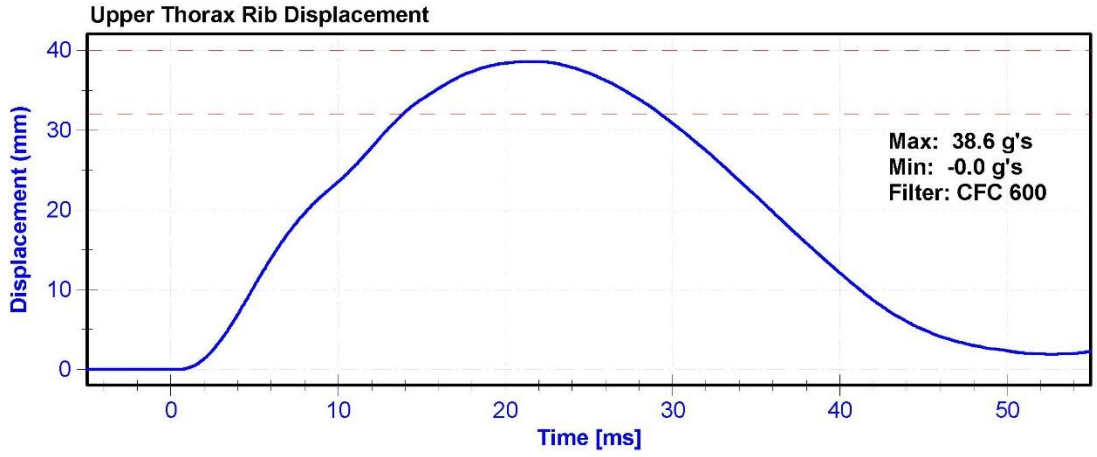
Results

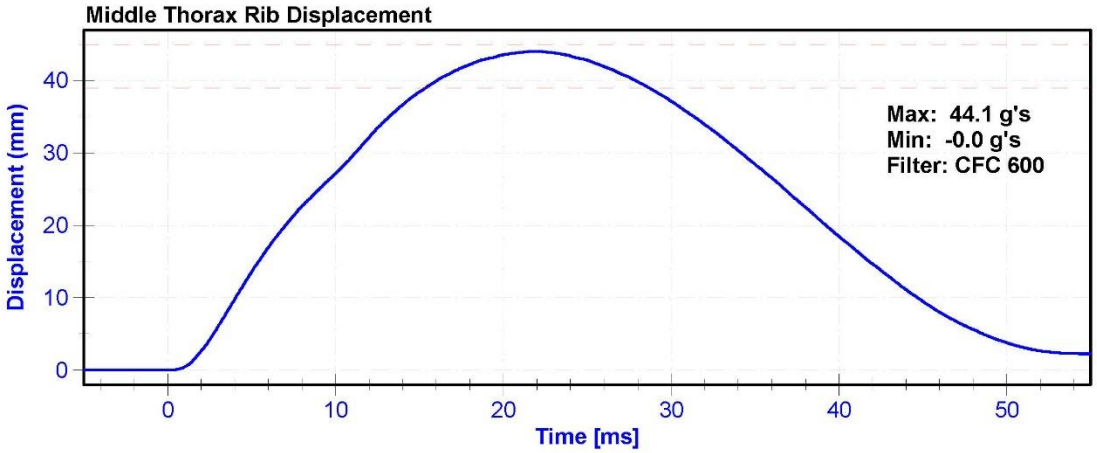
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.5	Pass
Humidity	10	70	%	38.3	Pass
Velocity	4.2	4.4	m/s	4.34	Pass
Probe Acceleration	14	18	g's	16.1	Pass
Lateral Upper Spine Acceleration	13	17	g's	14.6	Pass
Lateral Lower Spine Acceleration	7	11	g's	9.5	Pass
Upper Thorax Rib Deflection	32	40	mm	38.6	Pass
Middle Thorax Rib Deflection	39	45	mm	44.1	Pass
Lower Thorax Rib Deflection	35	43	mm	41.2	Pass

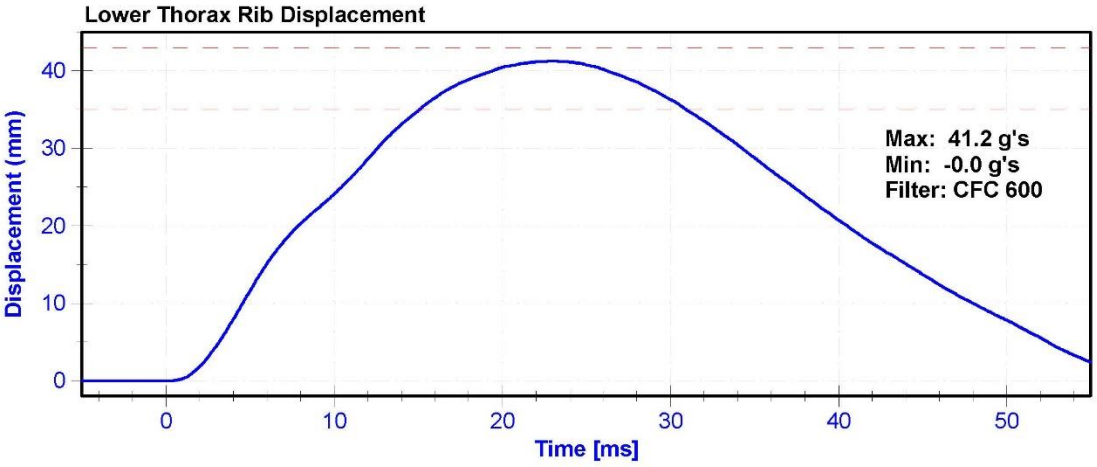
Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	ENDEVCO 7231CT	AC-C14972	8/13/2015	2/11/2016
Upper Spine Y Accelerometer	ENDEVCO 7264CT	AC-P63315	10/19/2015	4/18/2016
Lower Spine Y Accelerometer	ENDEVCO 7264CT	AC-P51974	10/19/2015	4/18/2016
Upper Thorax Rib Potentiometer	Servo 08CT1-3725	DS-1199GFE	10/19/2015	10/18/2016
Middle Thorax Rib Potentiometer	Servo 08CT1-3725	DS-1246GFE	10/19/2015	10/18/2016
Lower Thorax Rib Potentiometer	Servo 08CT1-3725	DS-1256GFE	10/19/2015	10/18/2016

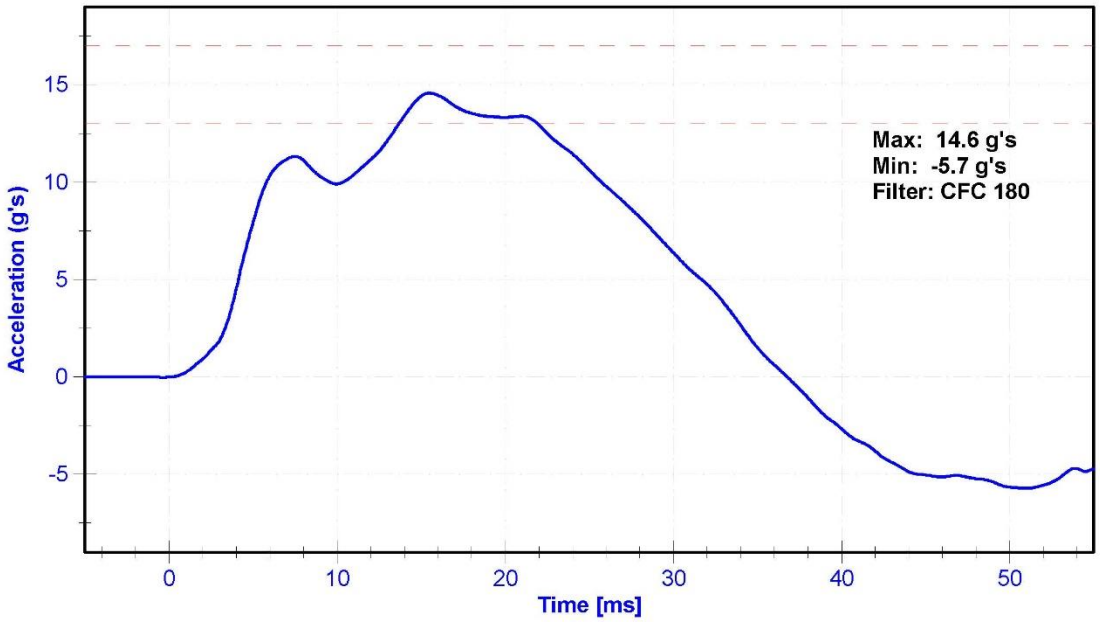



Upper Thorax Rib Displacement
Displacement (mm)
Time [ms]
Max: 38.6 g's
Min: -0.0 g's
Filter: CFC 600

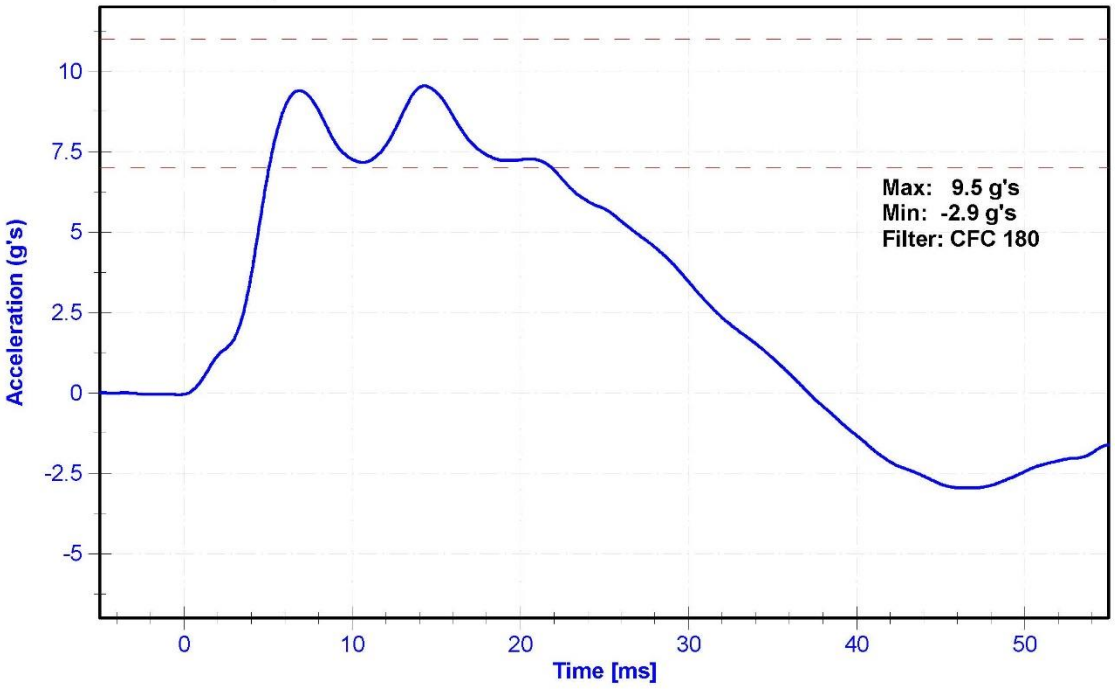

Middle Thorax Rib Displacement
Displacement (mm)
Time [ms]
Max: 44.1 g's
Min: -0.0 g's
Filter: CFC 600


Lower Thorax Rib Displacement
Displacement (mm)
Time [ms]
Max: 41.2 g's
Min: -0.0 g's
Filter: CFC 600

Lateral Upper Spine Acceleration



Lateral Lower Spine Acceleration



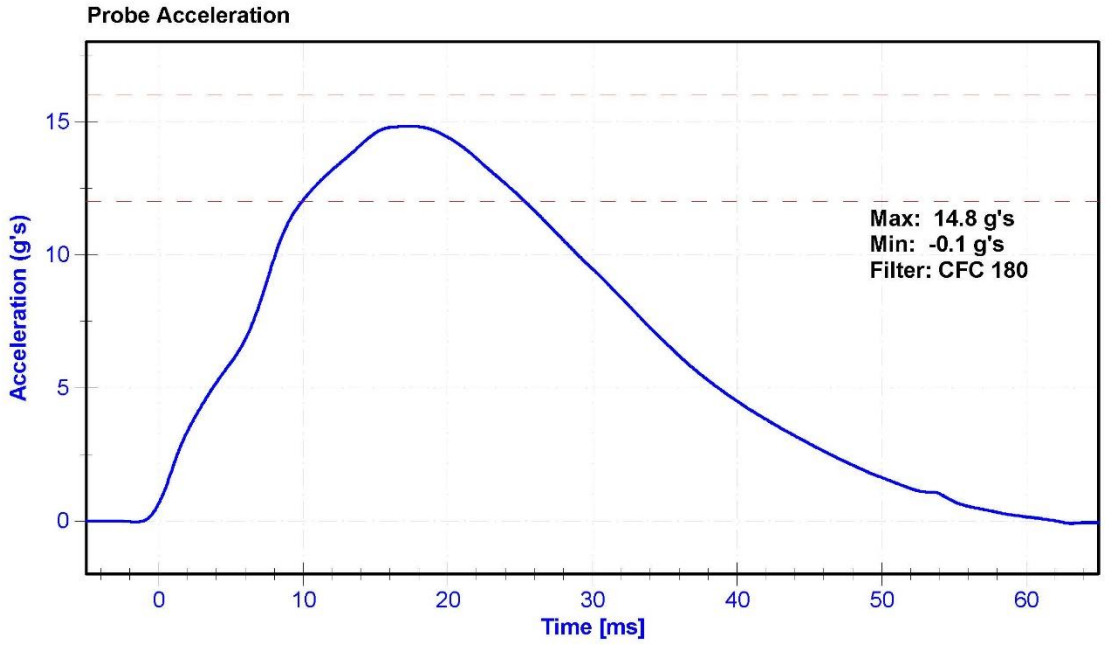
ATD Manufacturer	FTSS	Test Technician	M. Geesey
ATD Serial Number	303	Laboratory Supervisor	M. Goehle

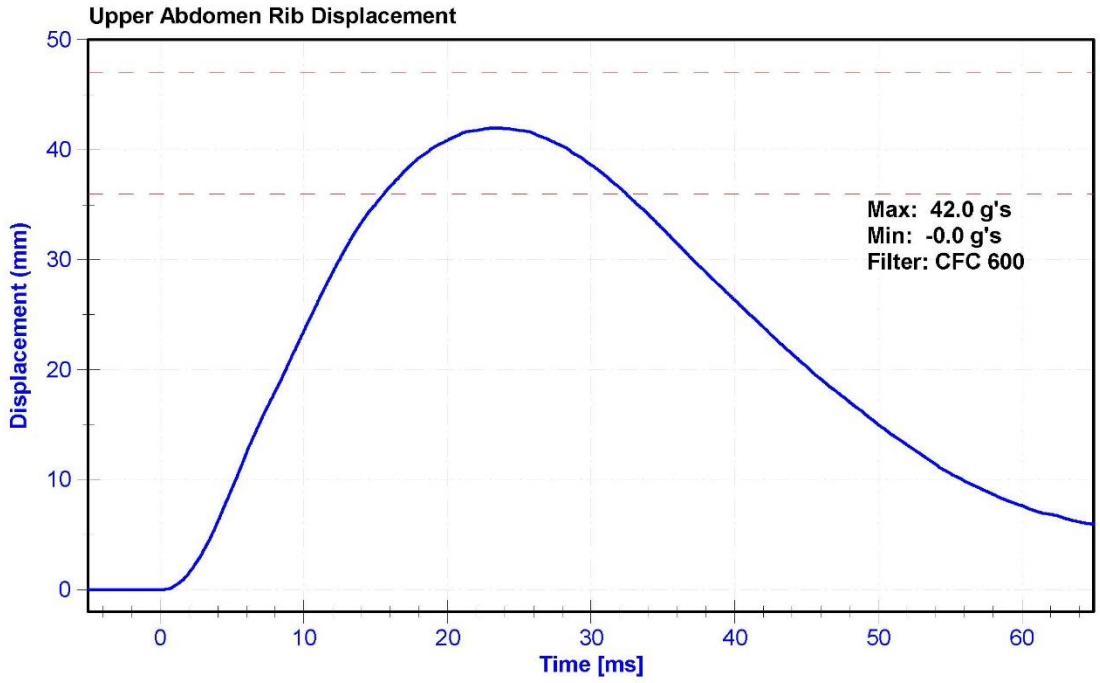
Results

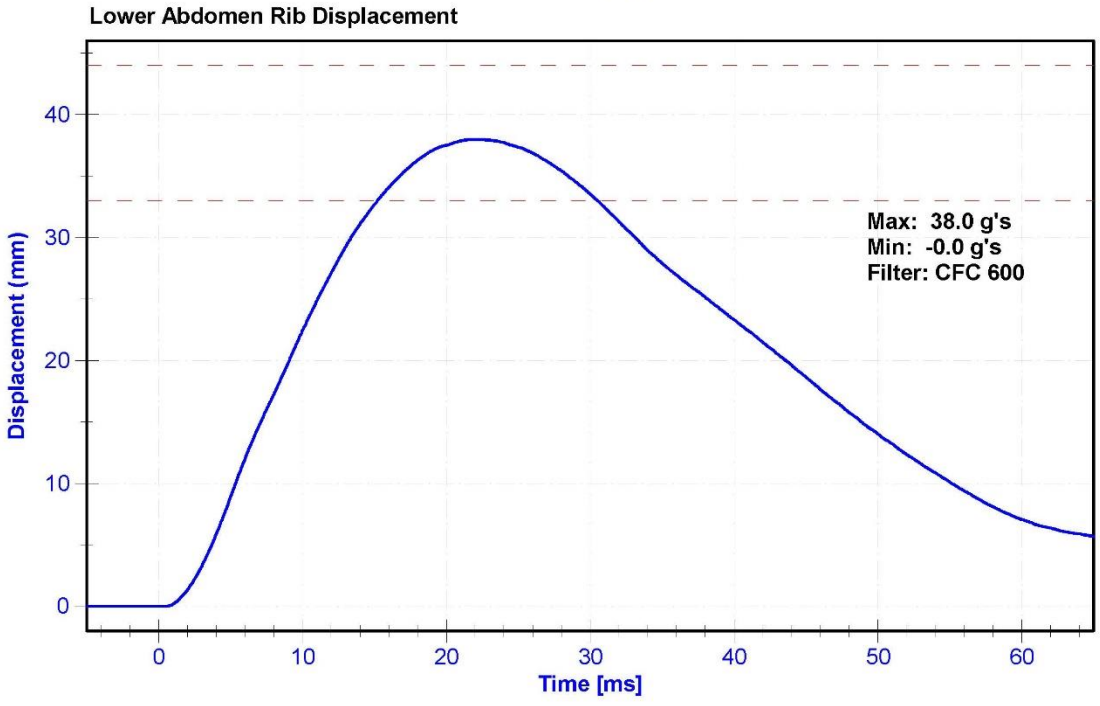
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.5	Pass
Humidity	10	70	%	38.0	Pass
Velocity	4.2	4.4	m/s	4.35	Pass
Probe Acceleration	12	16	g's	14.8	Pass
Lateral Lower Spine Acceleration	9	14	g's	11.0	Pass
Upper Abdomen Rib Deflection	36	47	mm	42.0	Pass
Lower Abdomen Rib Deflection	33	44	mm	38.0	Pass

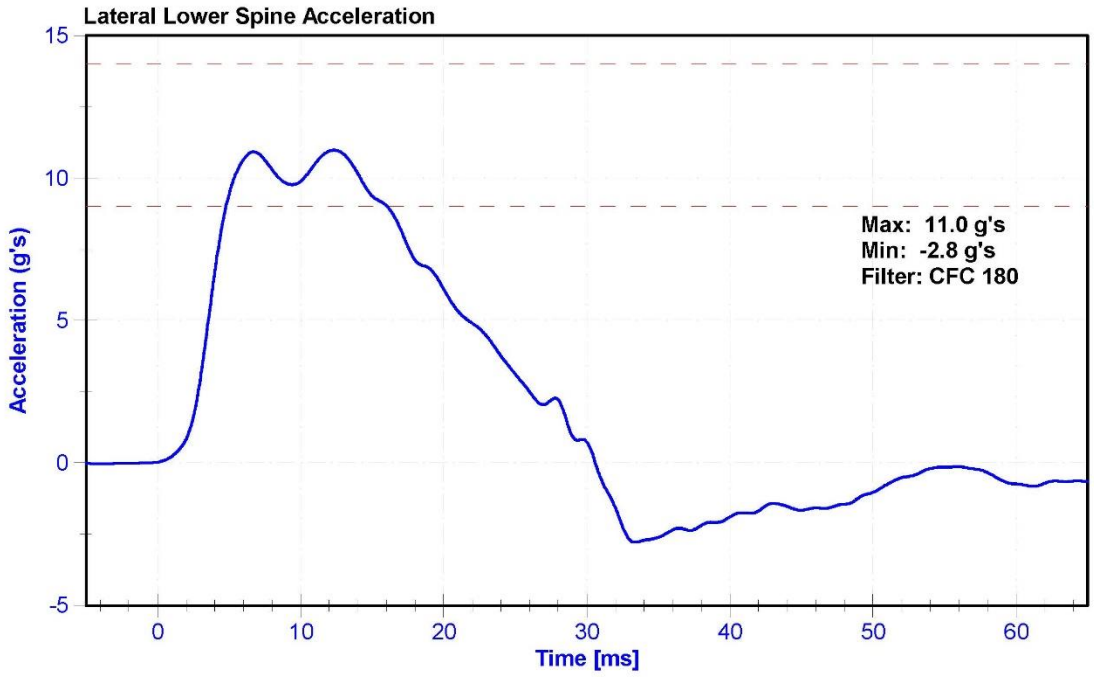
Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibratio Date	Calibration Due Date
Probe Accelerometer	ENDEVCO 7231CT	AC-C14972	8/13/2015	2/11/2016
Lower Spine Y Accelerometer	ENDEVCO 7264CT	AC-P51974	10/19/2015	4/18/2016
Upper Abdomen Rib Potentiometer	Servo 08CT1-3725	DS-1274GFE	10/19/2015	10/18/2016
Lower Abdomen Rib Potentiometer	Servo 08CT1-3745	DS-2316GFE	10/28/2015	10/27/2016

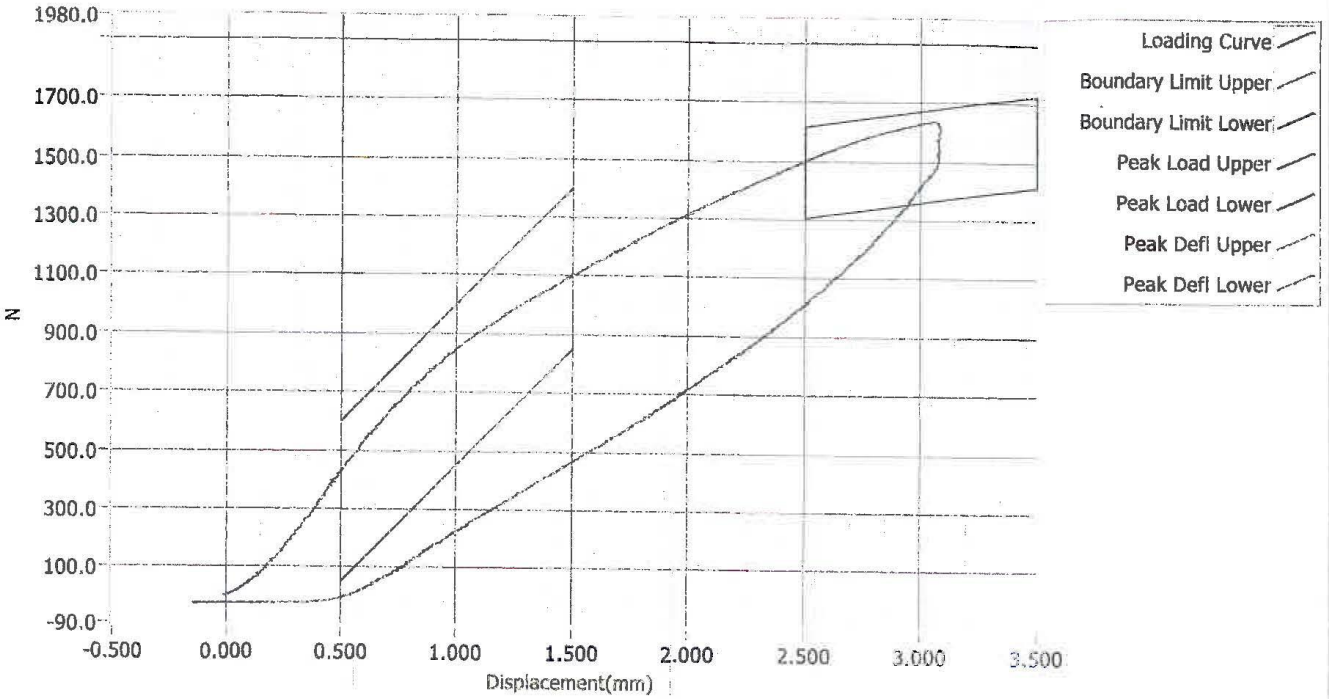



Upper Abdomen Rib Displacement
Displacement (mm)
Time [ms]
Max: 42.0 g's
Min: -0.0 g's
Filter: CFC 600


Lower Abdomen Rib Displacement
Displacement (mm)
Time [ms]
Max: 38.0 g's
Min: -0.0 g's
Filter: CFC 600


Lateral Lower Spine Acceleration
Acceleration (g's)
15
10
5
0
-5
0
10
20
30
40
50
60
Time [ms]
Max: 11.0 g's
Min: -2.8 g's
Filter: CFC 180

Resultant Data - SIDIIs Plug Compression



ATD Calibration Lab

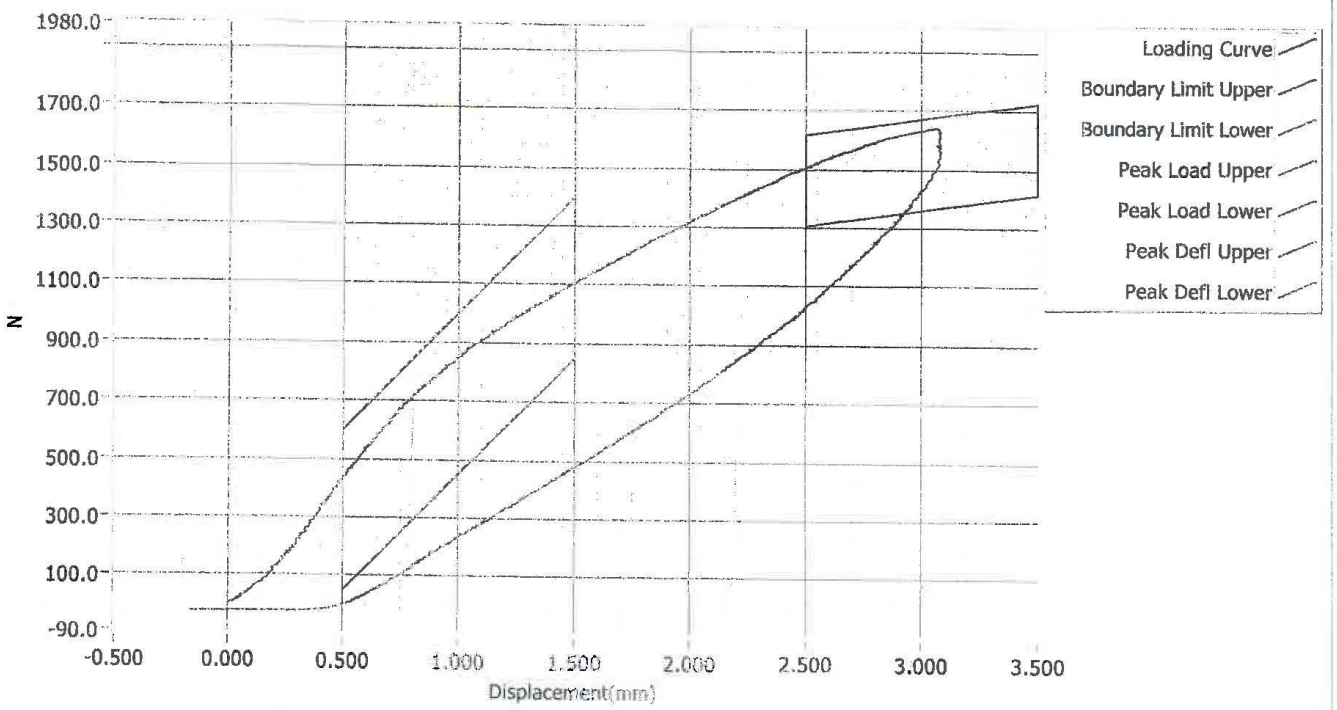
Test ID	Part Serial Number	Test Date	Test Time
	79624	11/5/2014	11:00 PM

CERTIFICATION
1631 N

Cert ID	ATD Serial Number	ATD Type
	N/A	SIDIIs

Current Date : 11/5/2014 Current Time : 23:01:56

Resultant Data - SIDIIs Plug Compression



ATD Calibration Lab

Test ID	Part Serial Number	Test Date	Test Time
	79584	11/5/2014	9:02 PM
Cert ID	ATD Serial Number	ATD Type	
	N/A	SIDIIs	

CRASH
1632 N

Current Date : 11/5/2014 Current Time : 21:06:35

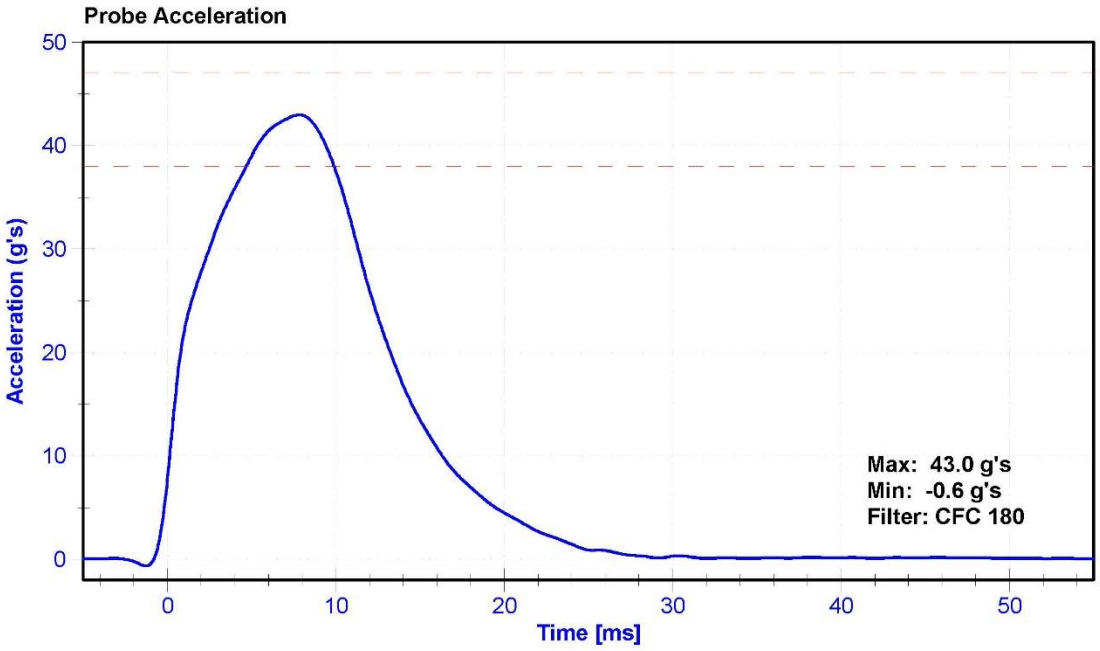
ATD Manufacturer	FTSS	Test Technician	M. Geesey
ATD Serial Number	303	Laboratory Supervisor	M. Goehle

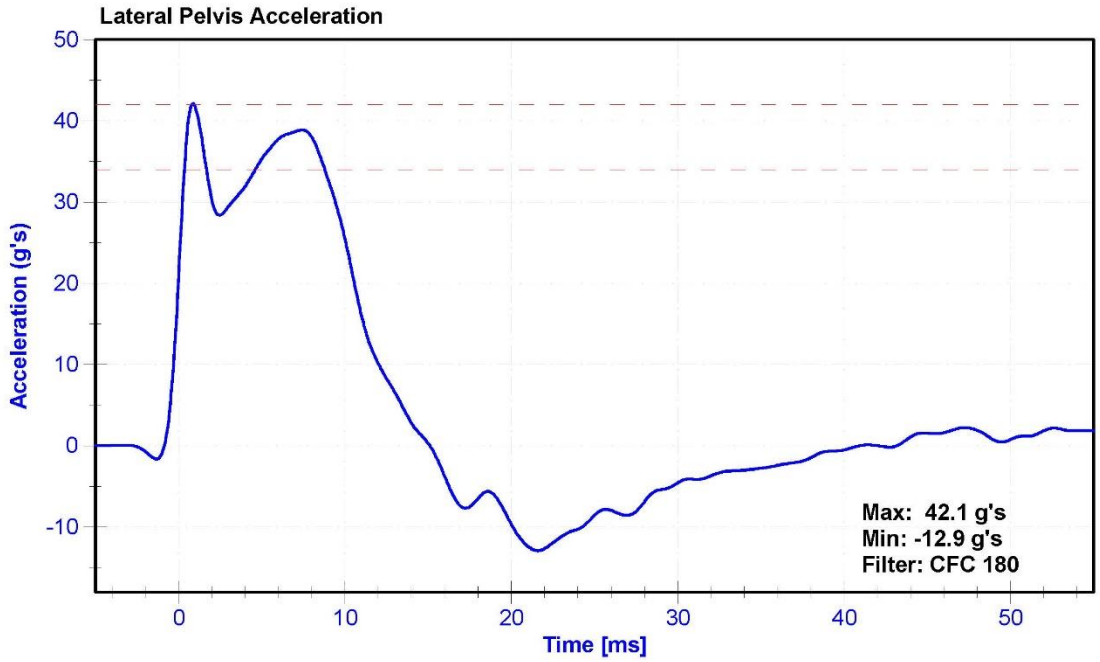
Results

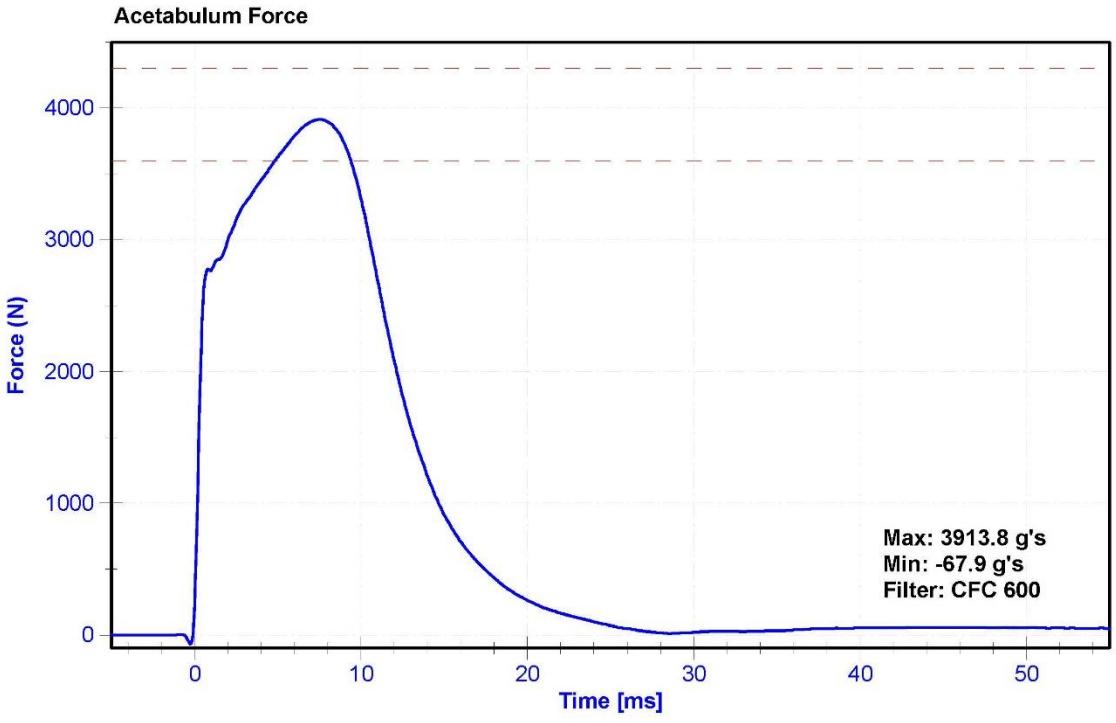
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.6	Pass
Humidity	10	70	%	41.1	Pass
Velocity	6.6	6.8	m/s	6.66	Pass
Probe Acceleration	38	47	g's	43.0	Pass
Lateral Pelvis Acceleration after 6ms	34	42	g's	38.9	Pass
Acetabulum Force	3600	4300	N	3913.8	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	ENDEVCO 7231CT	AC-C14972	8/13/2015	2/11/2016
Pelvis Y Accelerometer	ENDEVCO 7264	AC-P51259	10/19/2015	4/18/2016
Acetabulum Load Cell	Denton IF-520	LC-236Fy	6/29/2015	6/28/2016
Certification Plug	Humanetics	79624	11/05/2014	N/A
Crash Test Plug	Humanetics	79584	11/05/2014	N/A




Lateral Pelvis Acceleration
Acceleration (g's)
50
40
30
20
10
0
-10
0
10
20
30
40
50
Time [ms]
Max: 42.1 g's
Min: -12.9 g's
Filter: CFC 180


Acetabulum Force
Force (N)
4000
3000
2000
1000
0
0
10
20
30
40
50
Time [ms]
Max: 3913.8 g's
Min: -67.9 g's
Filter: CFC 600

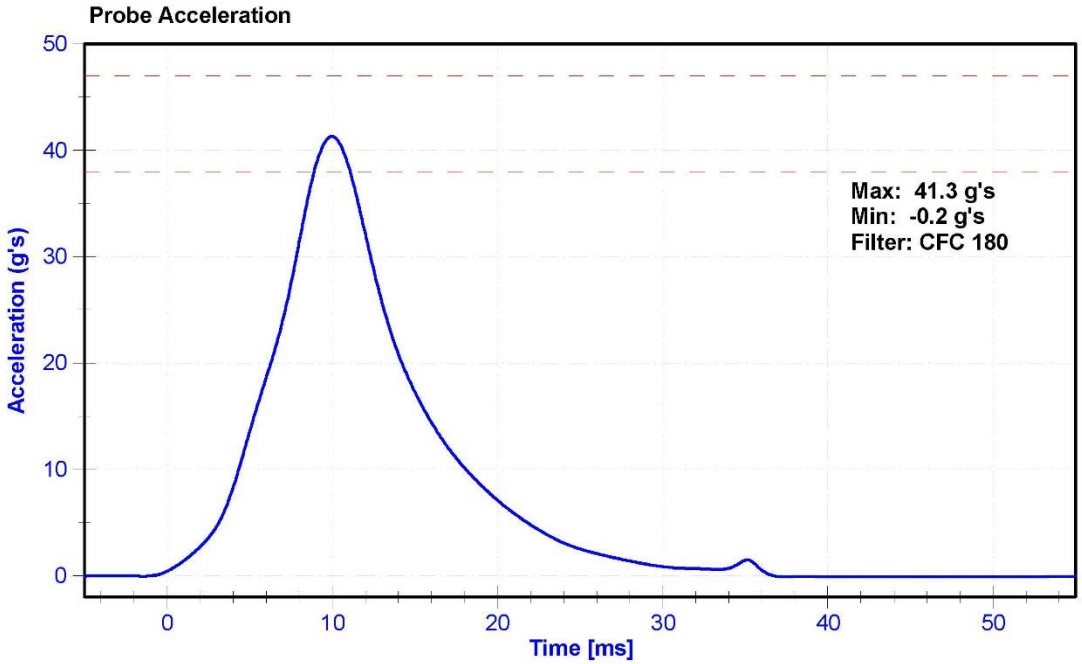
ATD Manufacturer	FTSS	Test Technician	M. Geesey
ATD Serial Number	303	Laboratory Supervisor	M. Goehle

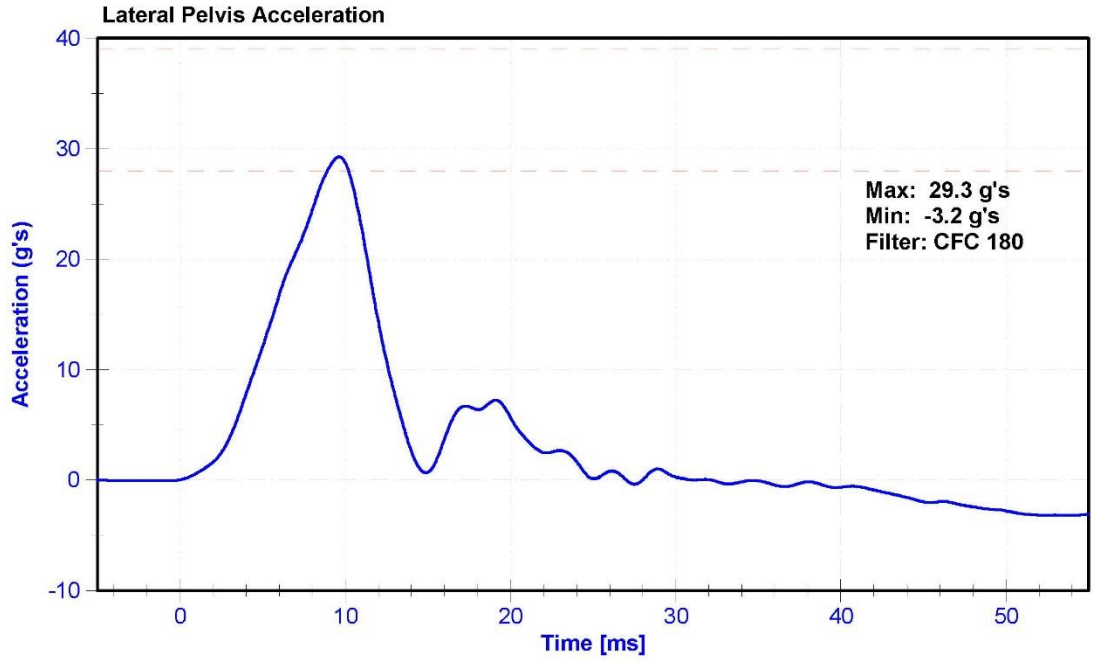
Results

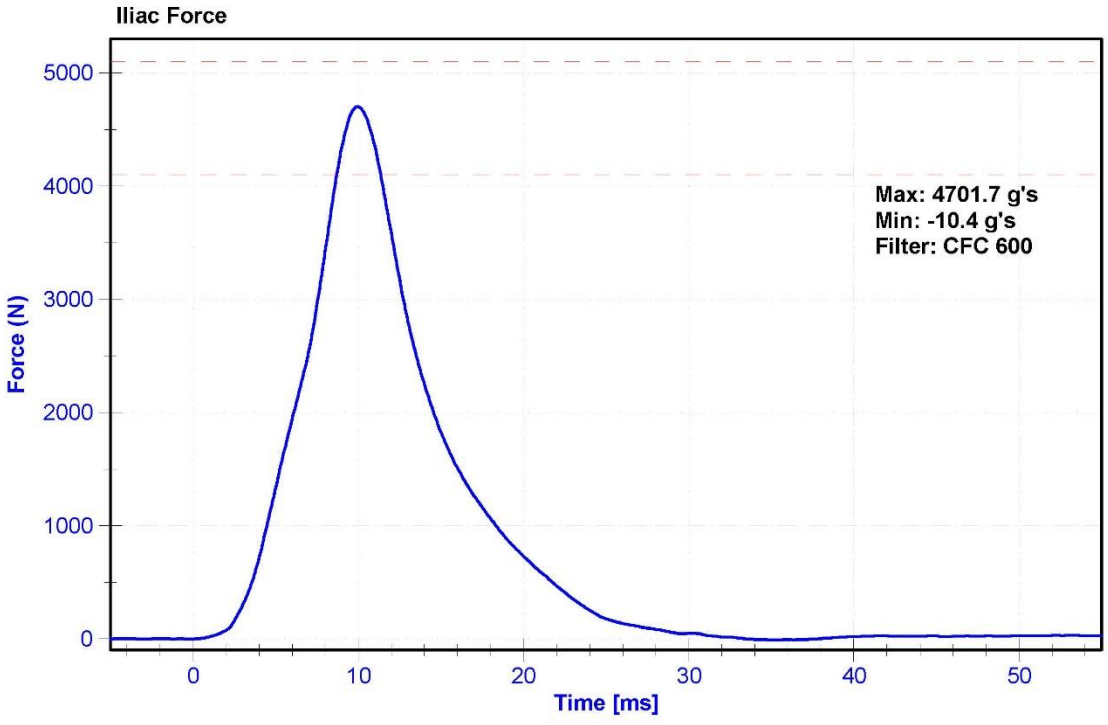
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	22.2	Pass
Humidity	10	70	%	38.9	Pass
Velocity	4.2	4.4	m/s	4.35	Pass
Probe Acceleration	36	45	g's	41.3	Pass
Lateral Pelvis Acceleration	28	39	g's	29.3	Pass
Iliac Force	4100	5100	N	4701.7	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	ENDEVCO 7231CT	AC-C14972	8/13/2015	2/11/2016
Pelvis Y Accelerometer	ENDEVCO 7264	AC-P51259	10/19/2015	4/18/2016
Iliac Load Cell	DENTON 3228J	LC-285Fy	7/21/2015	7/20/2016




Lateral Pelvis Acceleration
Acceleration (g's)
Time [ms]
Max: 29.3 g's
Min: -3.2 g's
Filter: CFC 180


Iliac Force
Force (N)
Time [ms]
Max: 4701.7 g's
Min: -10.4 g's
Filter: CFC 600

CALIBRATION TEST RESULTS

POST-TEST

SID-IIS 5TH PERCENTILE FEMALE - DRIVER ATD

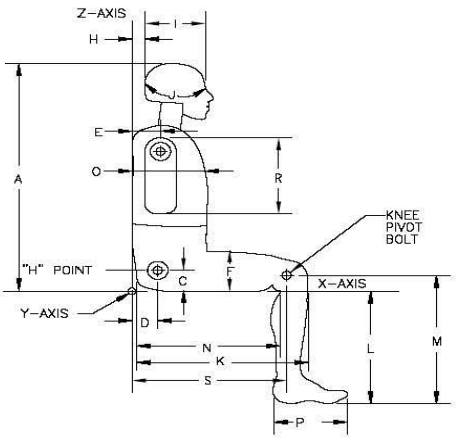
SERIAL NO: 303

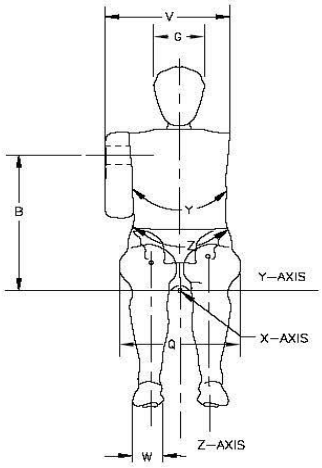
(CONFIGURED FOR LEFT SIDE IMPACT)

External Measurements - SID-IIs

Technician: M.Hartung Date: 2/8/2016

Dummy Serial Number: 303





Symbol	Description	Specification (mm)		Result (mm)	Pass/Fail
A	Sitting Height	772	788	781	Pass
B	Shoulder Pivot Height	437	453	445	Pass
C	H-point Height	79	89	86	Pass
D	H-point from seatback	141	151	147	Pass
E	Shoulder Pivot from Backline	97	107	103	Pass
F	Thigh Clearance	119	135	125	Pass
G	Head Breadth	140	148	143	Pass
H	Head Back from Backline	40	46	44	Pass
I	Head Depth	178	188	181	Pass
J	Head Circumference	541	551	546	Pass
K	Buttock to Knee Length	514	540	530	Pass
L	Popliteal Height	343	369	355	Pass
M	Knee Pivot to floor height	392	409	400	Pass
N	Buttock Popliteal Length	416	442	438	Pass
O	Chest Depth w/o jacket	195	211	206	Pass
P	Foot Length	216	232	219	Pass
Q	Hip Breadth (w/pelvic plugs)	313	323	320	Pass
R	Arm Length	249	259	253	Pass
S	Knee Joint to seatback	477	493	488	Pass
V	Shoulder Width	341	357	350	Pass
W	Foot Width	78	94	85	Pass
Y	Chest Circumference w/jacket	851	881	869	Pass
Z	Waist Circumference	761	791	770	Pass

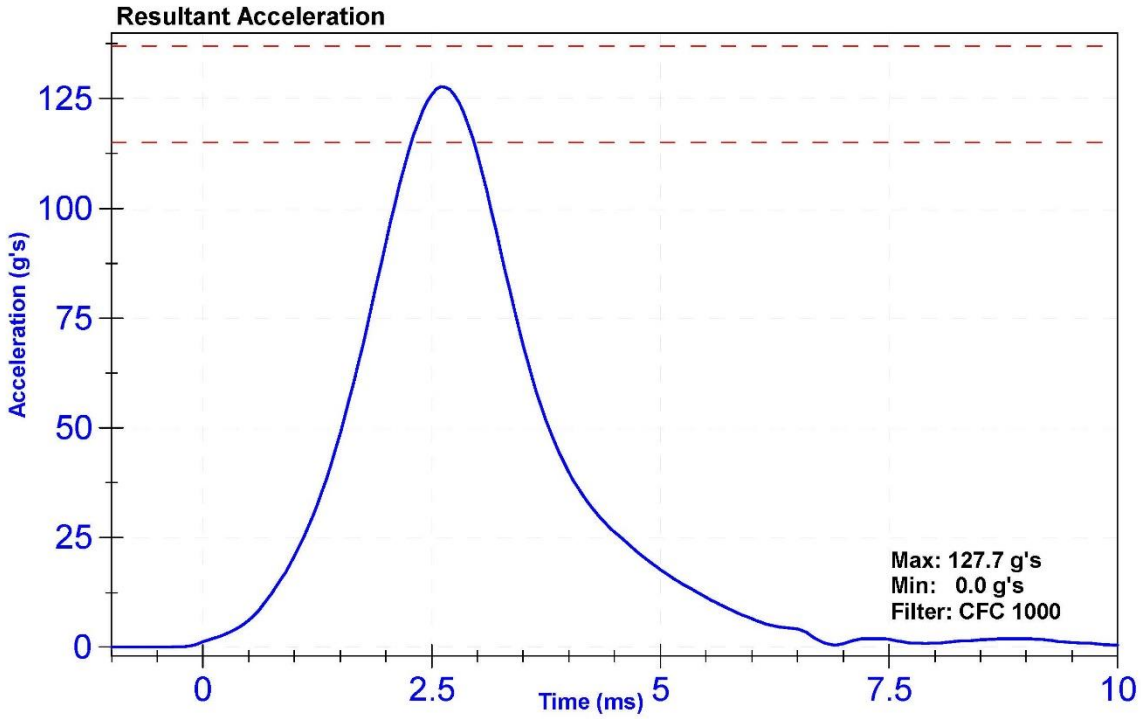
ATD Manufacturer	FTSS	Test Technician	M.Hartung
ATD Serial Number	303	Laboratory Supervisor	M.Goehle

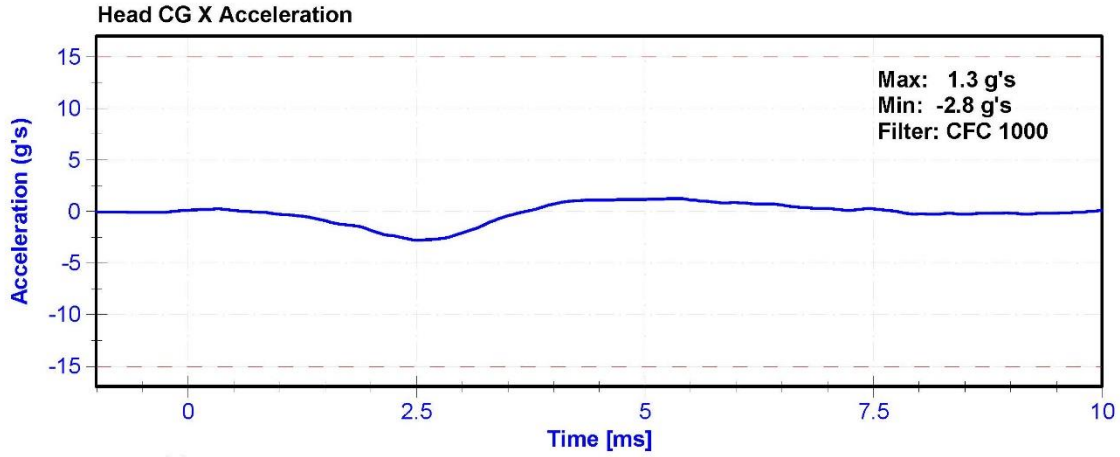
Results

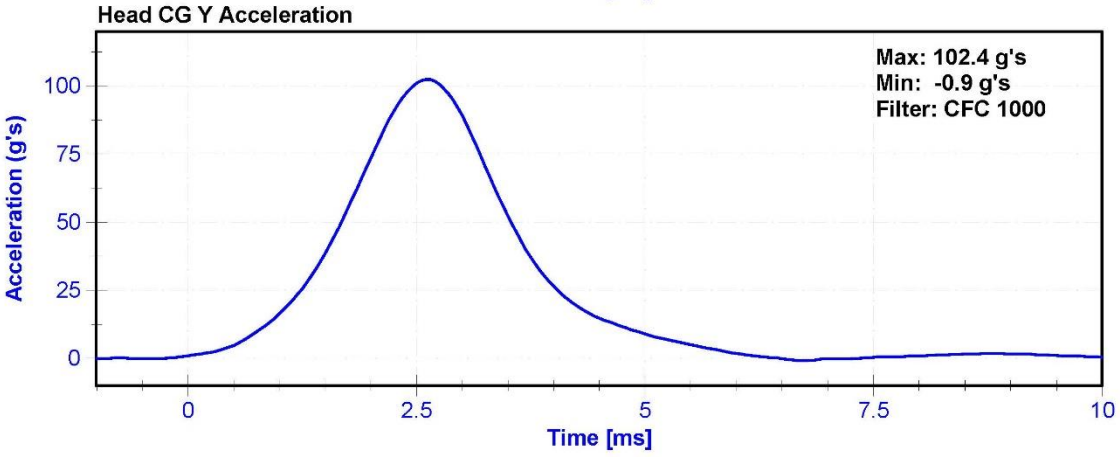
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.9	Pass
Humidity	10	70	%	22.2	Pass
Resultant Acceleration	115	137	g's	127.7	Pass
Oscillation	0	15	%	1.5	Pass
Fore-Aft Acceleration	-15	15	g's	-2.8	Pass

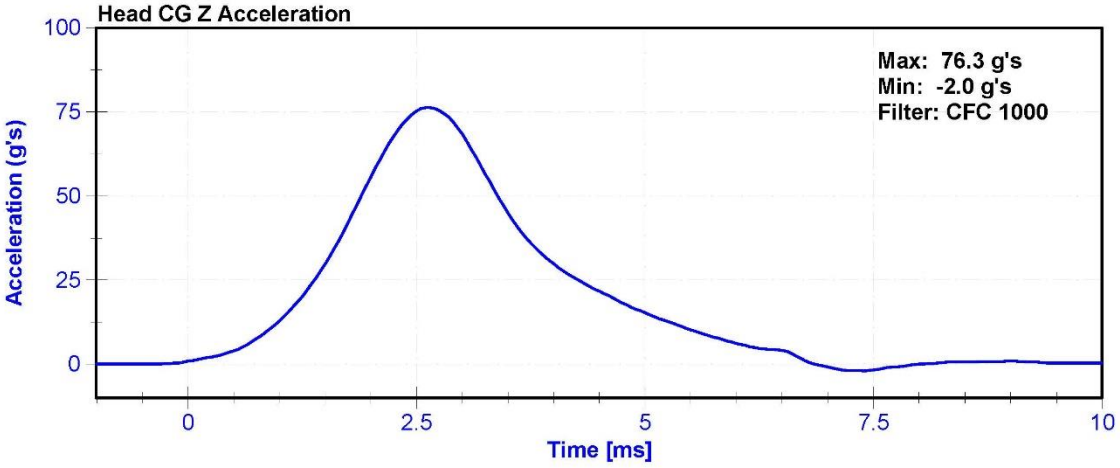
Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
X Accelerometer	ENDEVCO 7264	AC-P83420	10/16/2015	4/15/2016
Y Accelerometer	ENDEVCO 7264	AC-P52040	10/14/2015	4/13/2016
Z Accelerometer	ENDEVCO 7264CT	AC-P58737	10/14/2015	4/13/2016




Head CG X Acceleration
Max: 1.3 g's
Min: -2.8 g's
Filter: CFC 1000
Acceleration (g's)
15
10
5
0
-5
-10
-15
0
2.5
5
7.5
10
Time [ms]


Head CG Y Acceleration
Max: 102.4 g's
Min: -0.9 g's
Filter: CFC 1000
Acceleration (g's)
100
75
50
25
0
0
2.5
5
7.5
10
Time [ms]


Head CG Z Acceleration
Max: 76.3 g's
Min: -2.0 g's
Filter: CFC 1000
Acceleration (g's)
100
75
50
25
0
0
2.5
5
7.5
10
Time [ms]

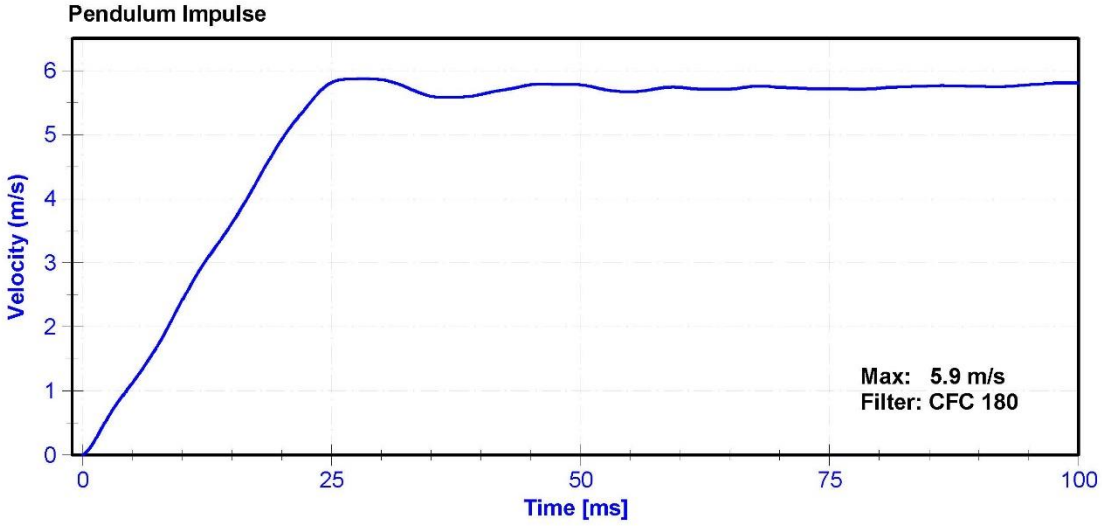
ATD Manufacturer	FTSS	Test Technician	M.Hartung
ATD Serial Number	303	Laboratory Supervisor	M.Goehle

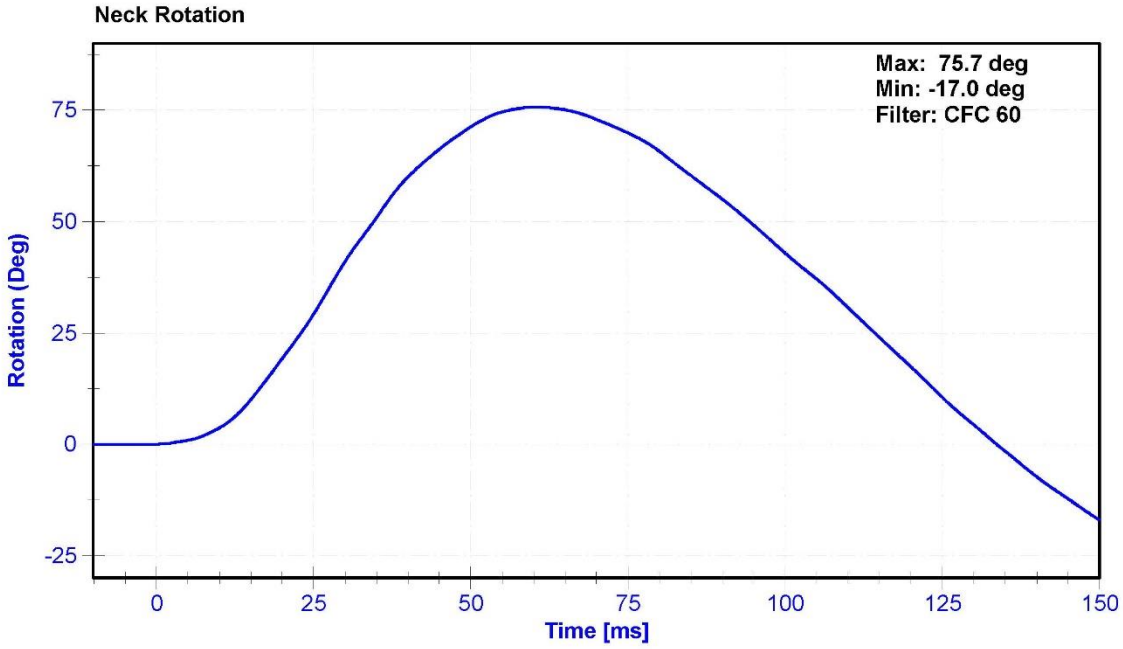
Results

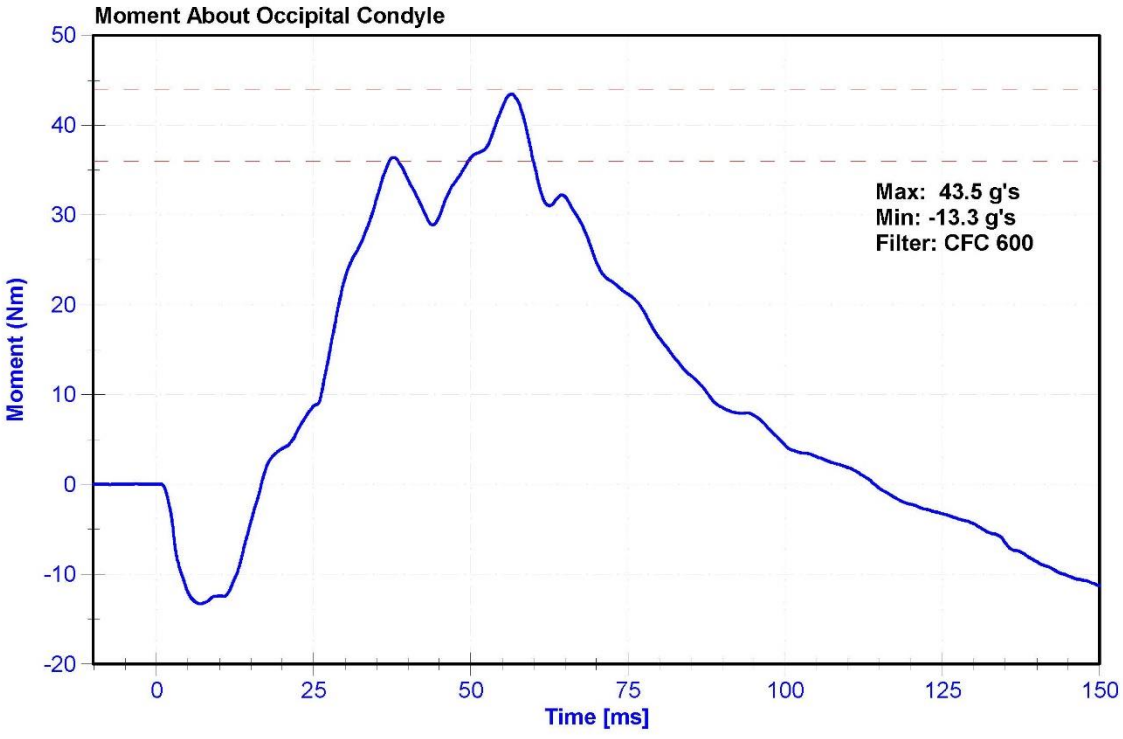
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.8	Pass
Humidity	10	70	%	25.7	Pass
Velocity	5.51	5.63	m/s	5.583	Pass
Pendulum Impulse at 10ms	2.2	2.8	m/s	2.41	Pass
Pendulum Impulse at 15ms	3.3	4.1	m/s	3.62	Pass
Pendulum Impulse at 20ms	4.4	5.4	m/s	4.93	Pass
Pendulum Impulse at 25ms	5.4	6.1	m/s	5.81	Pass
Pendulum Impulse from 25 to 100ms	5.5	6.2	m/s	5.87	Pass
Neck Rotation	71	81	deg	75.7	Pass
Time at Maximum Rotation	50	70	ms	60.5	Pass
Moment about the OC	36	44	Nm	43.5	Pass
Moment Decay to 0 Nm	102	126	ms	114.3	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	ENDEVCO 7231CT	AC-AH5F3	5/7/2015	5/6/2016
Pendulum Potentiometer	Denton 78051-342	DS-184Pend	9/24/2015	9/23/2016
Condyle Potentiometer	Denton 78051-342	DS-185Pend	9/25/2015	9/24/2016
Upper Neck Load Cell	Denton 1716A	LC-2019Fy	6/29/2015	6/28/2016




Neck Rotation
Max: 75.7 deg
Min: -17.0 deg
Filter: CFC 60
Rotation (Deg)
75
50
25
0
-25
0
25
50
75
100
125
150
Time [ms]


Moment About Occipital Condyle
Max: 43.5 g's
Min: -13.3 g's
Filter: CFC 600
Moment (Nm)
50
40
30
20
10
0
-10
-20
0
25
50
75
100
125
150
Time [ms]

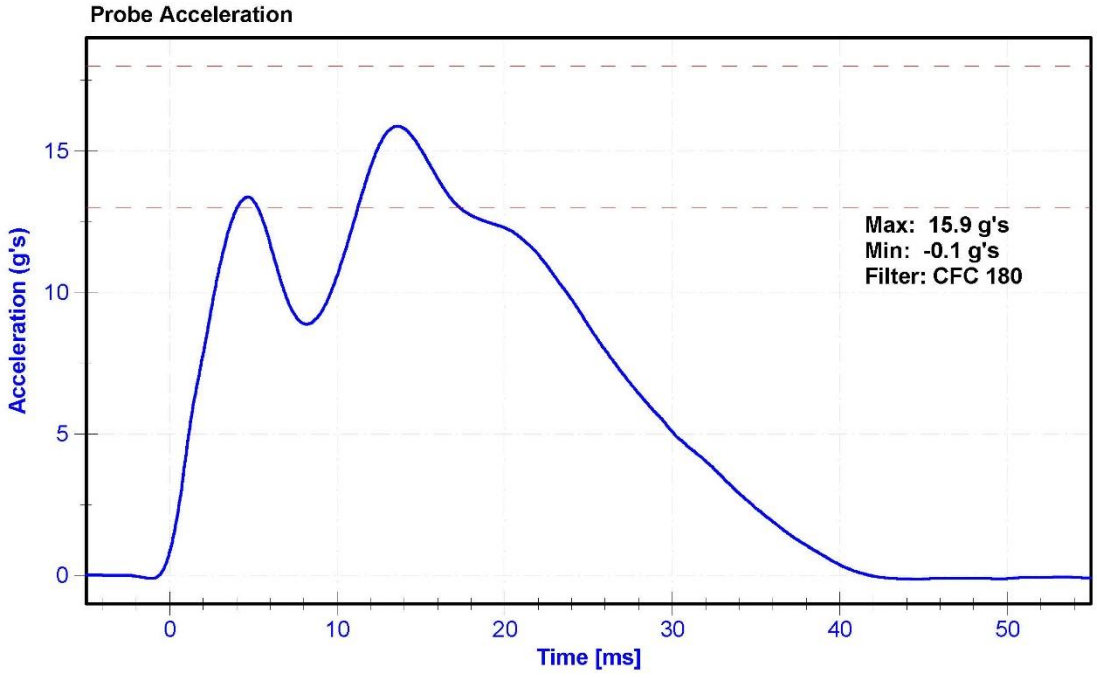
ATD Manufacturer	FTSS	Test Technician	M.Hartung
ATD Serial Number	303	Laboratory Supervisor	M.Goehle

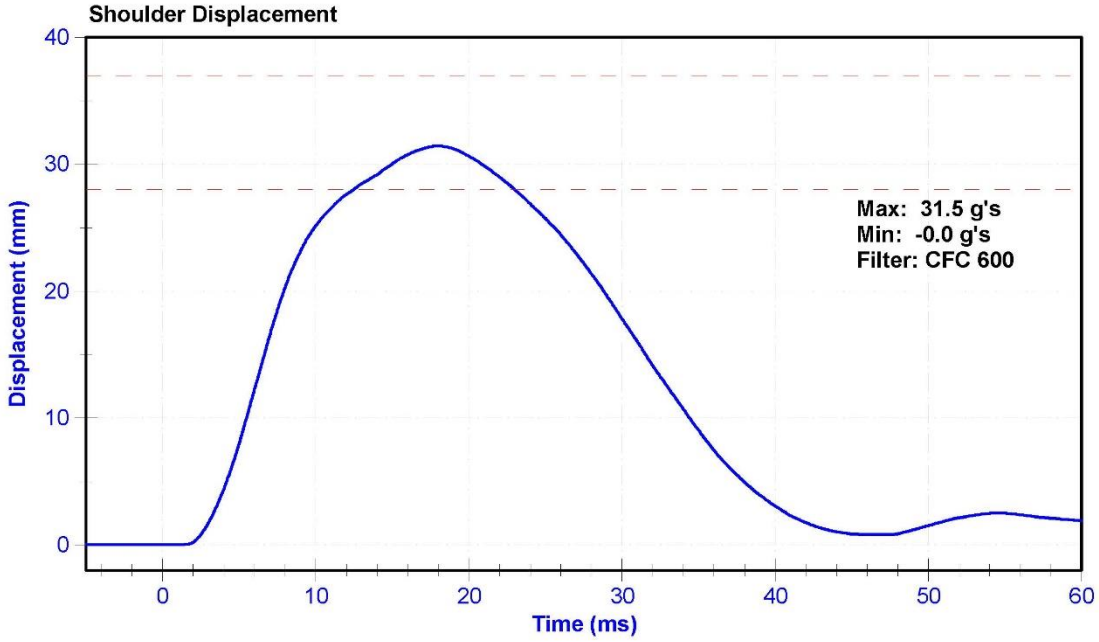
Results

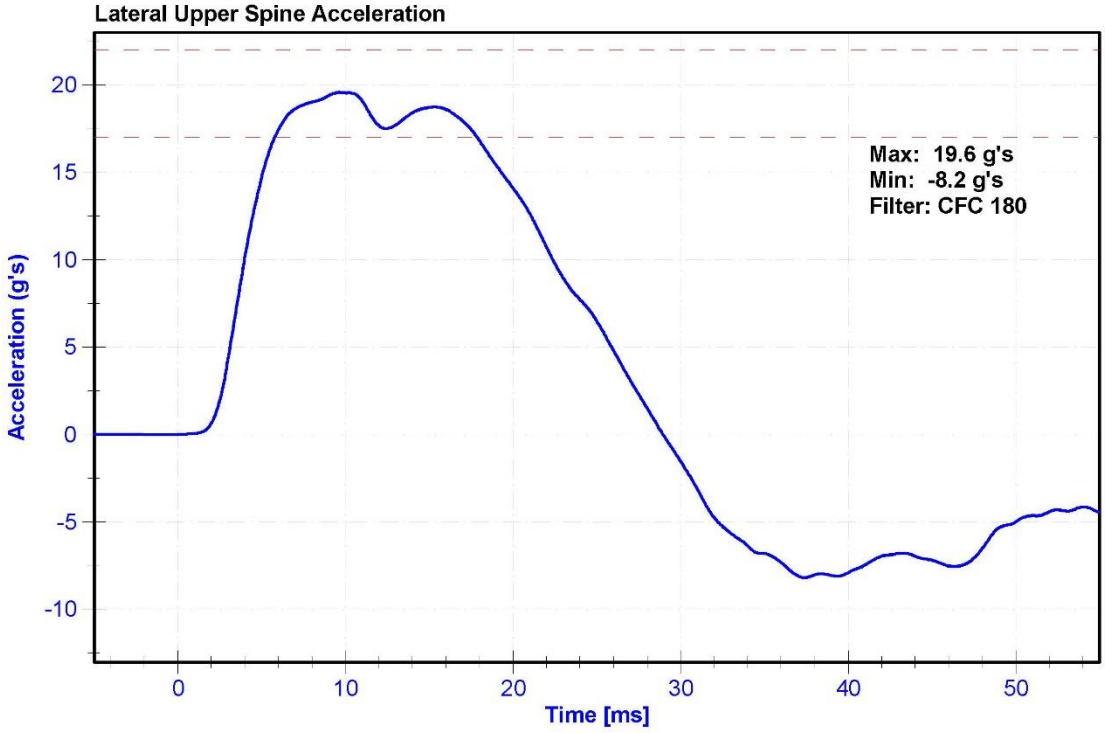
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	20.7	Pass
Humidity	10	70	%	24.1	Pass
Velocity	4.2	4.4	m/s	4.35	Pass
Probe Acceleration	13	18	g's	15.9	Pass
Shoulder Deflection	28	37	mm	31.5	Pass
Lateral Upper Spine Acceleration	17	22	g's	19.6	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	ENDEVCO 7264CT	AC-P23155	1/13/2016	7/14/2016
Shoulder Potentiometer	Servo 08TC1-3725	DS-008GFE	10/19/2015	10/18/2016
Upper Spine Y Accelerometer	ENDEVCO 7264CT	AC-P63315	10/19/2015	4/18/2016




Shoulder Displacement
Displacement (mm)
Time (ms)
Max: 31.5 g's
Min: -0.0 g's
Filter: CFC 600


Lateral Upper Spine Acceleration
Acceleration (g's)
Time [ms]
Max: 19.6 g's
Min: -8.2 g's
Filter: CFC 180

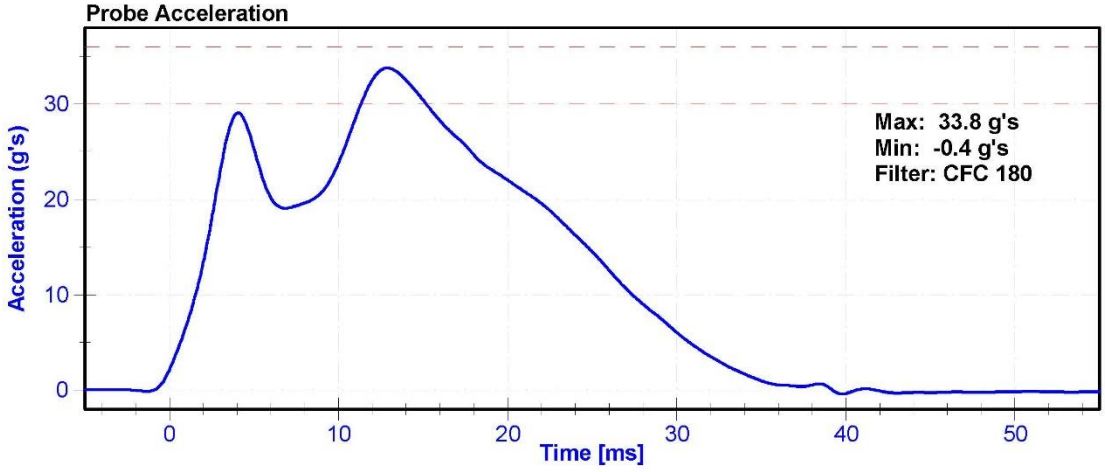
ATD Manufacturer	FTSS	Test Technician	M.Hartung
ATD Serial Number	303	Laboratory Supervisor	M.Goehle

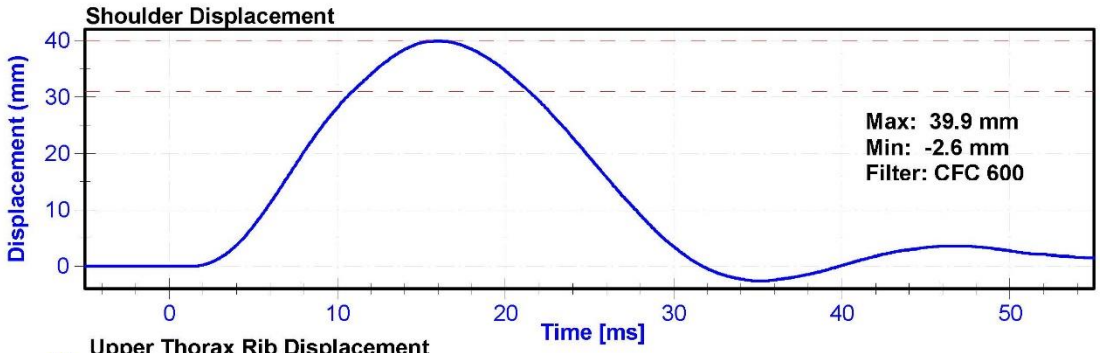
Results

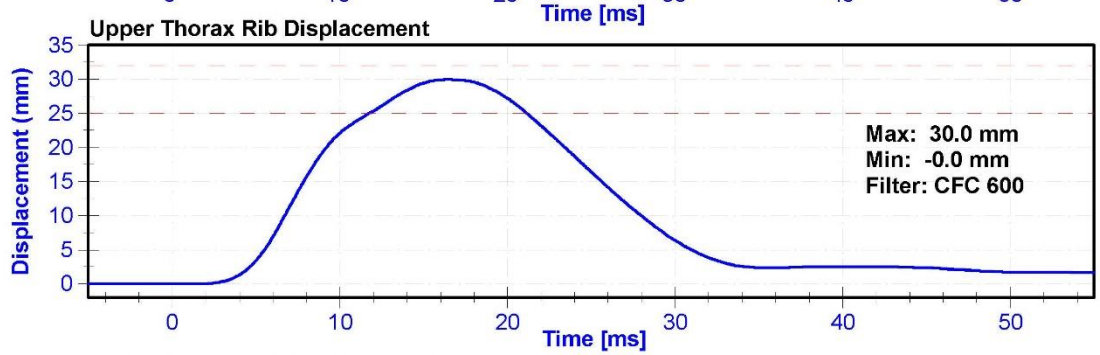
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	20.6	Pass
Humidity	10	70	%	24.4	Pass
Velocity	6.6	6.8	m/s	6.67	Pass
Probe Acceleration after 5 ms	30	36	g's	33.8	Pass
Lateral Upper Spine Acceleration	34	43	g's	38.7	Pass
Lateral Lower Spine Acceleration	29	37	g's	32.7	Pass
Shoulder Deflection	31	40	mm	39.9	Pass
Upper Thorax Rib Deflection	25	32	mm	30.0	Pass
Mid Thorax Rib Deflection	30	36	mm	32.9	Pass
Lower Thorax Rib Deflection	32	38	mm	34.1	Pass

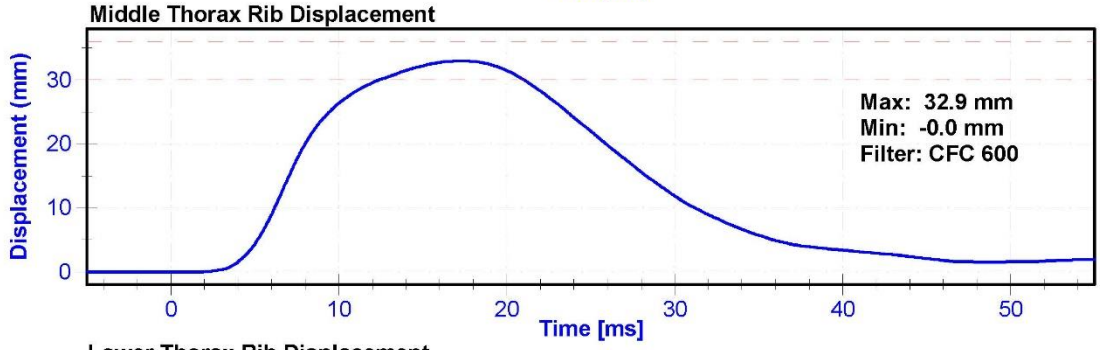
Transducer Calibrations

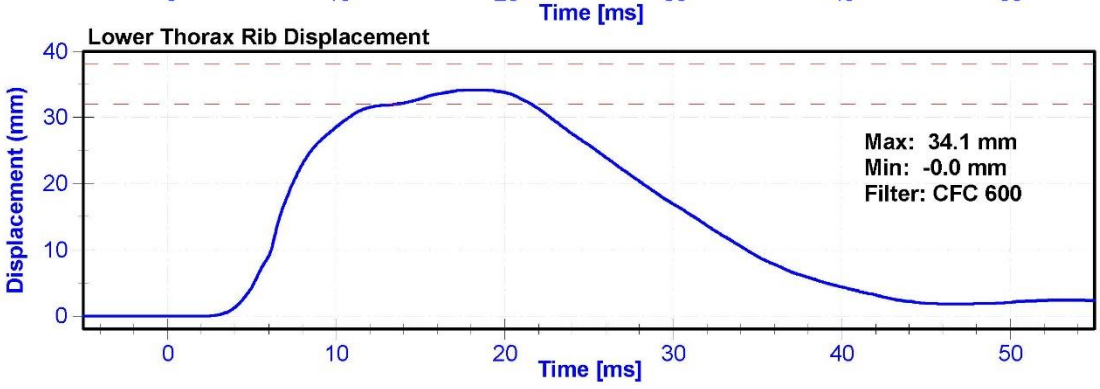
Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	ENDEVCO 7264CT	AC-P23155	1/13/2016	7/14/2016
Upper Spine T1 Y Accelerometer	ENDEVCO 7264CT	AC-P63315	10/19/2015	4/18/2016
Upper Spine T12 Y Accelerometer	ENDEVCO 7264CT	AC-P51974	10/19/2015	4/18/2016
Shoulder Potentiometer	Servo 08TC1-3725	DS-008GFE	10/19/2015	10/18/2016
Upper Thorax Rib Potentiometer	Servo 08CT1-3725	DS-1199GFE	10/19/2015	10/18/2016
Middle Thorax Rib Potentiometer	Servo 08CT1-3725	DS-1246GFE	10/19/2015	10/18/2016
Lower Thorax Rib Potentiometer	Servo 08CT1-3725	DS-1256GFE	10/19/2015	10/18/2016

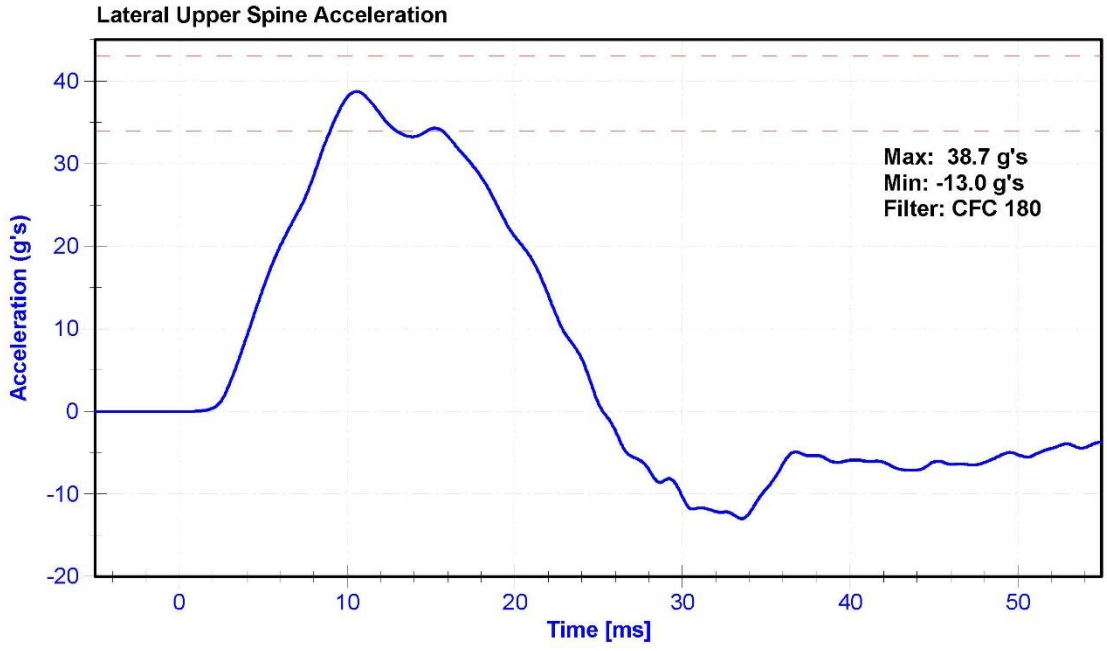


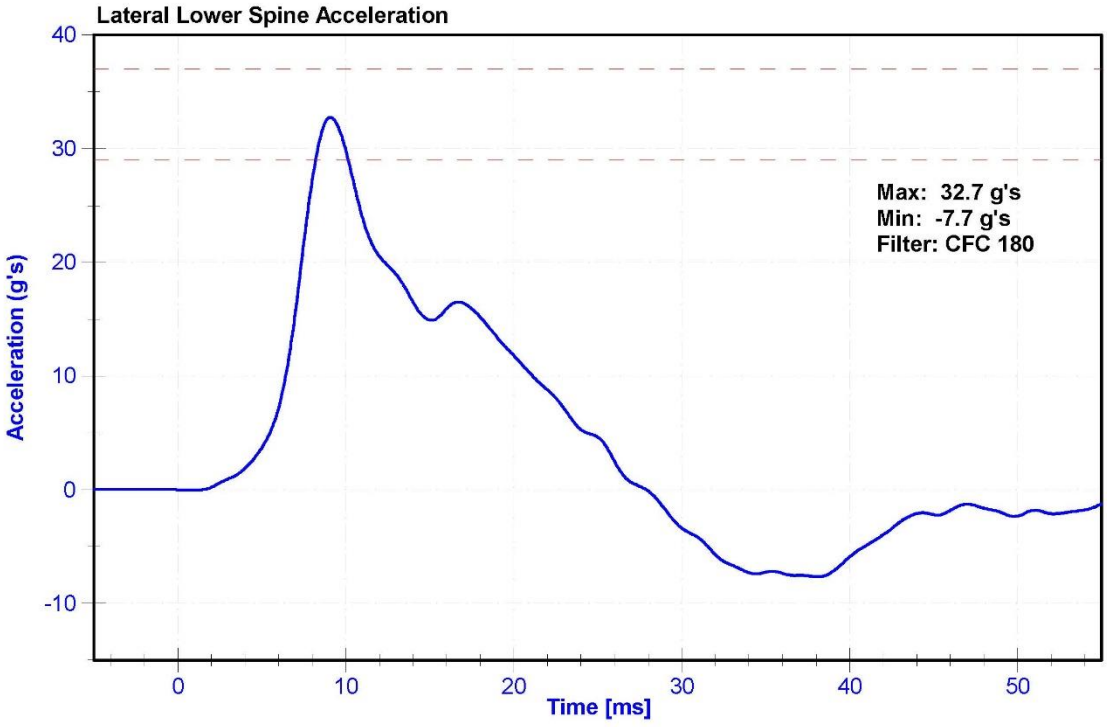

Shoulder Displacement
Displacement (mm)
Time [ms]
Max: 39.9 mm
Min: -2.6 mm
Filter: CFC 600


Upper Thorax Rib Displacement
Displacement (mm)
Time [ms]
Max: 30.0 mm
Min: -0.0 mm
Filter: CFC 600


Middle Thorax Rib Displacement
Displacement (mm)
Time [ms]
Max: 32.9 mm
Min: -0.0 mm
Filter: CFC 600


Lower Thorax Rib Displacement
Displacement (mm)
Time [ms]
Max: 34.1 mm
Min: -0.0 mm
Filter: CFC 600


Lateral Upper Spine Acceleration
Max: 38.7 g's
Min: -13.0 g's
Filter: CFC 180
Acceleration (g's)
Time [ms]
40
30
20
10
0
-10
-20
0
10
20
30
40
50


Lateral Lower Spine Acceleration
Max: 32.7 g's
Min: -7.7 g's
Filter: CFC 180
Acceleration (g's)
Time [ms]
40
30
20
10
0
-10
0
10
20
30
40
50

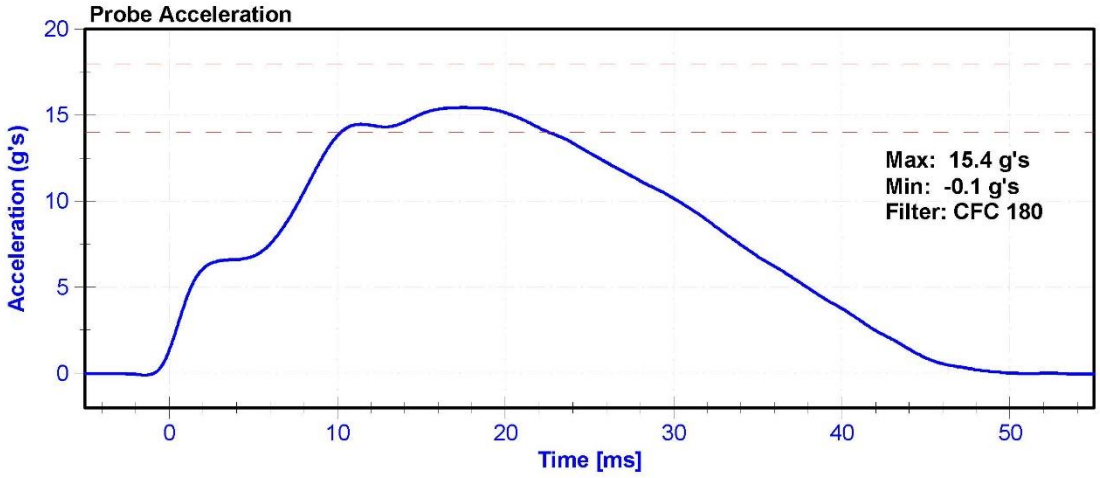
ATD Manufacturer	FTSS	Test Technician	M.Hartung
ATD Serial Number	303	Laboratory Supervisor	M.Goehle

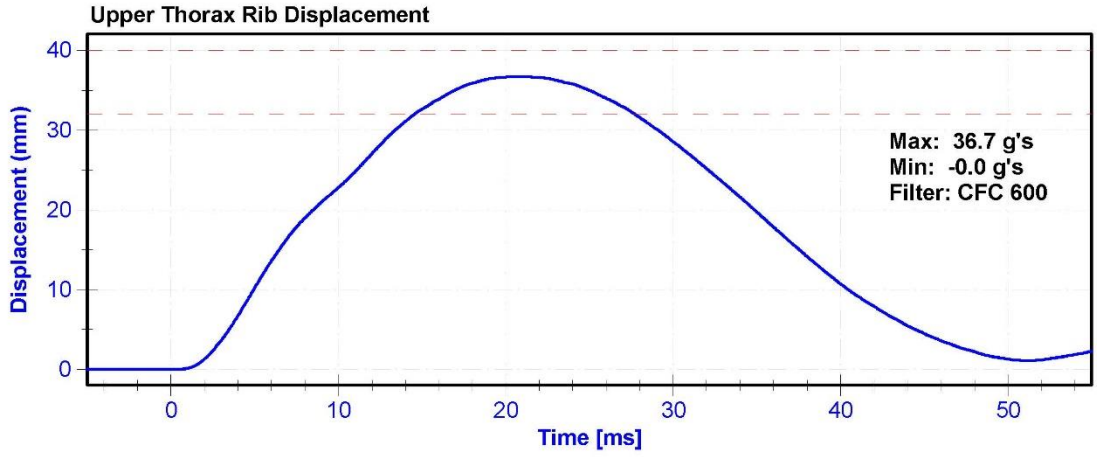
Results

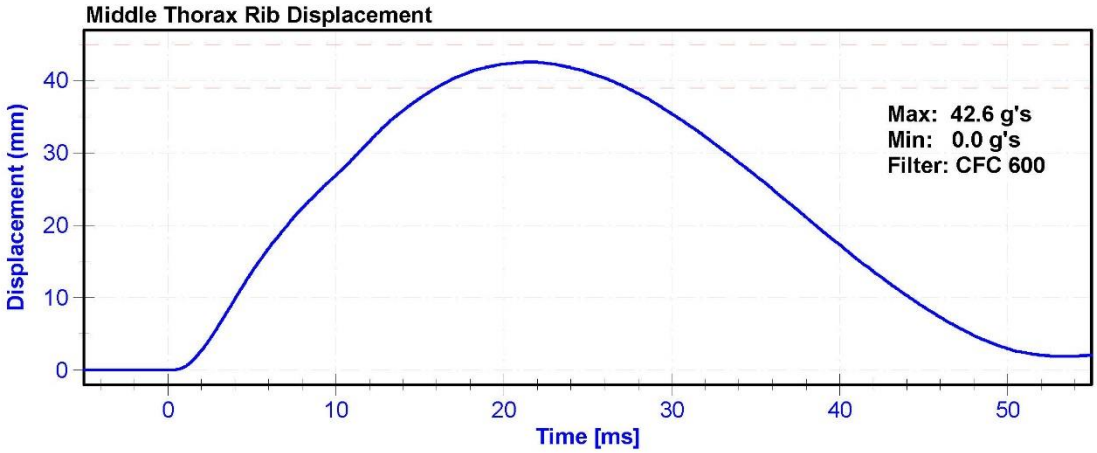
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	20.8	Pass
Humidity	10	70	%	24.3	Pass
Velocity	4.2	4.4	m/s	4.32	Pass
Probe Acceleration	14	18	g's	15.4	Pass
Lateral Upper Spine Acceleration	13	17	g's	15.4	Pass
Lateral Lower Spine Acceleration	7	11	g's	9.2	Pass
Upper Thorax Rib Deflection	32	40	mm	36.7	Pass
Middle Thorax Rib Deflection	39	45	mm	42.6	Pass
Lower Thorax Rib Deflection	35	43	mm	40.7	Pass

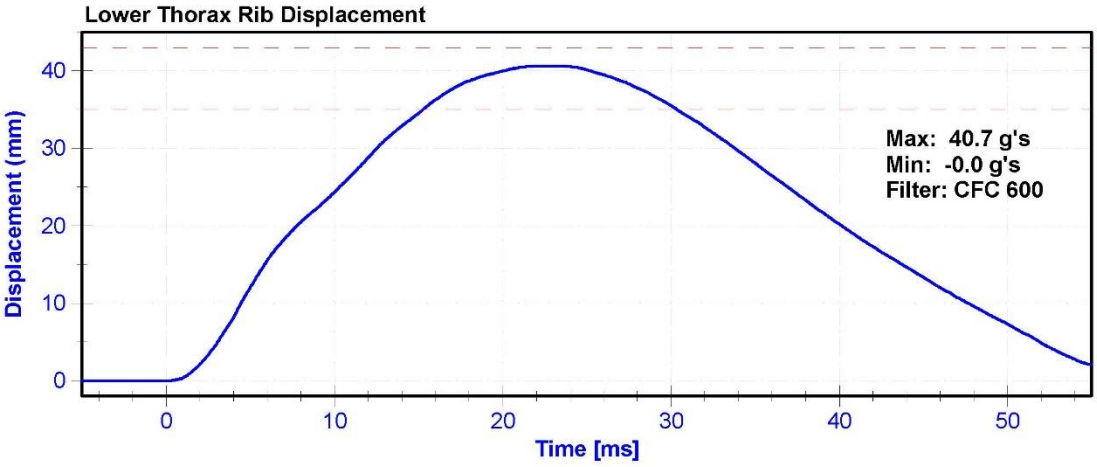
Transducer Calibrations

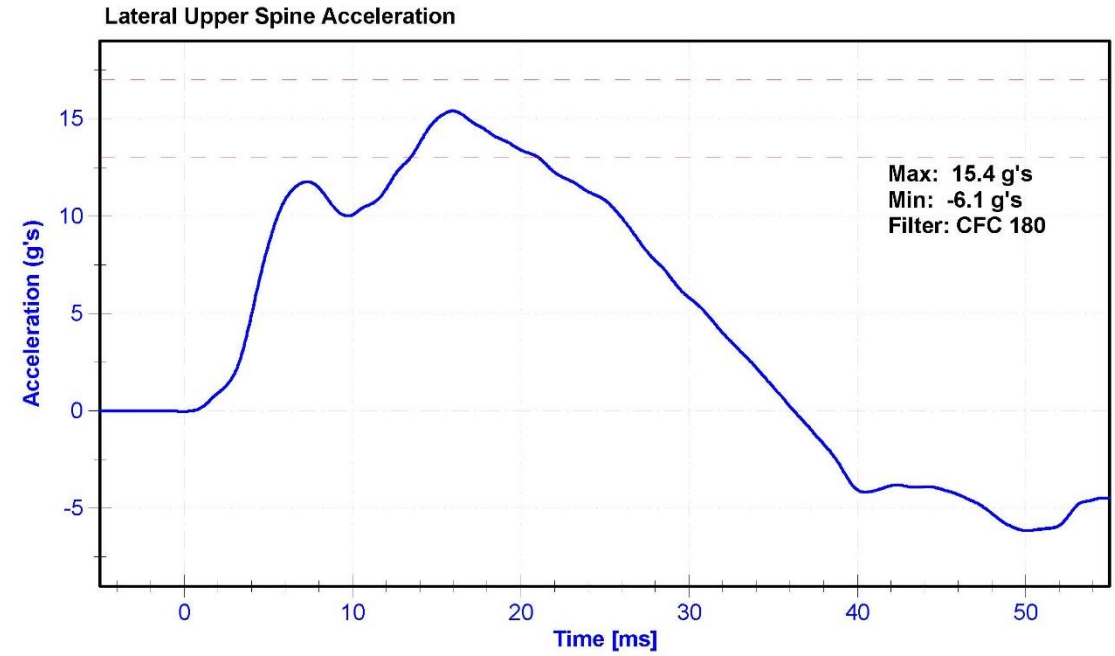
Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	ENDEVCO 7264CT	AC-P23155	1/13/2016	7/14/2016
Upper Spine Y Accelerometer	ENDEVCO 7264CT	AC-P63315	10/19/2015	4/18/2016
Lower Spine Y Accelerometer	ENDEVCO 7264CT	AC-P51974	10/19/2015	4/18/2016
Upper Thorax Rib Potentiometer	Servo 08CT1-3725	DS-1199GFE	10/19/2015	10/18/2016
Middle Thorax Rib Potentiometer	Servo 08CT1-3725	DS-1246GFE	10/19/2015	10/18/2016
Lower Thorax Rib Potentiometer	Servo 08CT1-3725	DS-1256GFE	10/19/2015	10/18/2016

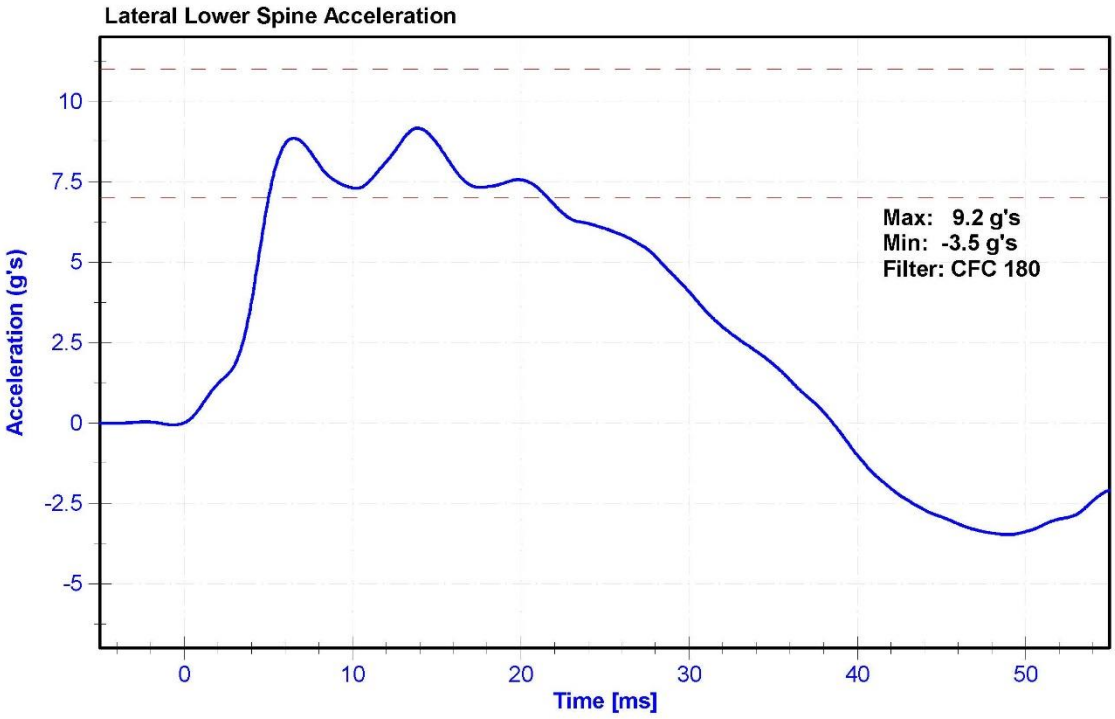



Upper Thorax Rib Displacement
Displacement (mm)
Time [ms]
Max: 36.7 g's
Min: -0.0 g's
Filter: CFC 600


Middle Thorax Rib Displacement
Displacement (mm)
Time [ms]
Max: 42.6 g's
Min: 0.0 g's
Filter: CFC 600


Lower Thorax Rib Displacement
Displacement (mm)
Time [ms]
Max: 40.7 g's
Min: -0.0 g's
Filter: CFC 600


Lateral Upper Spine Acceleration
Max: 15.4 g's
Min: -6.1 g's
Filter: CFC 180
Acceleration (g's)
15
10
5
0
-5
0
10
20
30
40
50
Time [ms]


Lateral Lower Spine Acceleration
Max: 9.2 g's
Min: -3.5 g's
Filter: CFC 180
Acceleration (g's)
10
7.5
5
2.5
0
-2.5
-5
0
10
20
30
40
50
Time [ms]

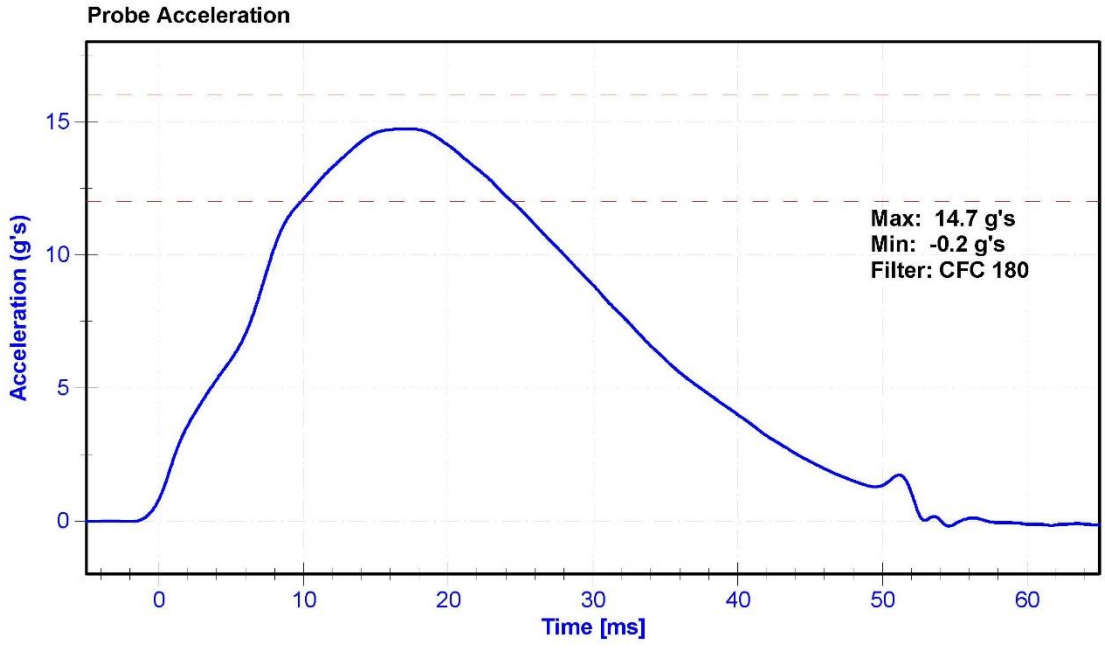
ATD Manufacturer	FTSS	Test Technician	M.Hartung
ATD Serial Number	303	Laboratory Supervisor	M.Goehle

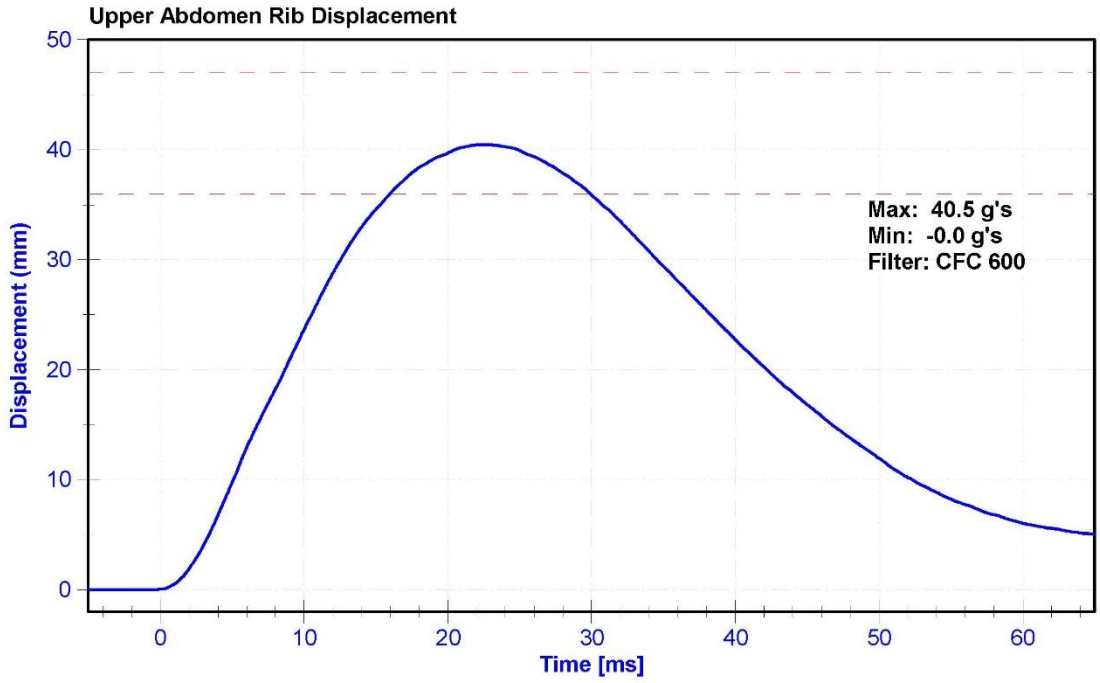
Results

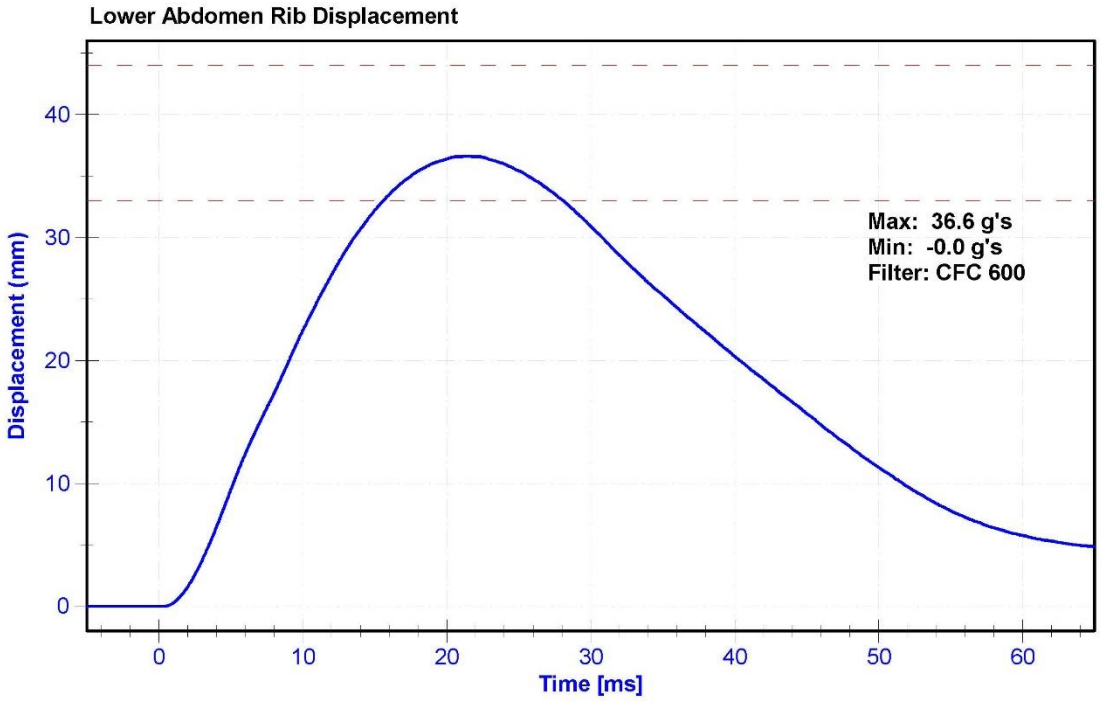
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	20.7	Pass
Humidity	10	70	%	24.4	Pass
Velocity	4.2	4.4	m/s	4.33	Pass
Probe Acceleration	12	16	g's	14.7	Pass
Lateral Lower Spine Acceleration	9	14	g's	11.1	Pass
Upper Abdomen Rib Deflection	36	47	mm	40.5	Pass
Lower Abdomen Rib Deflection	33	44	mm	36.6	Pass

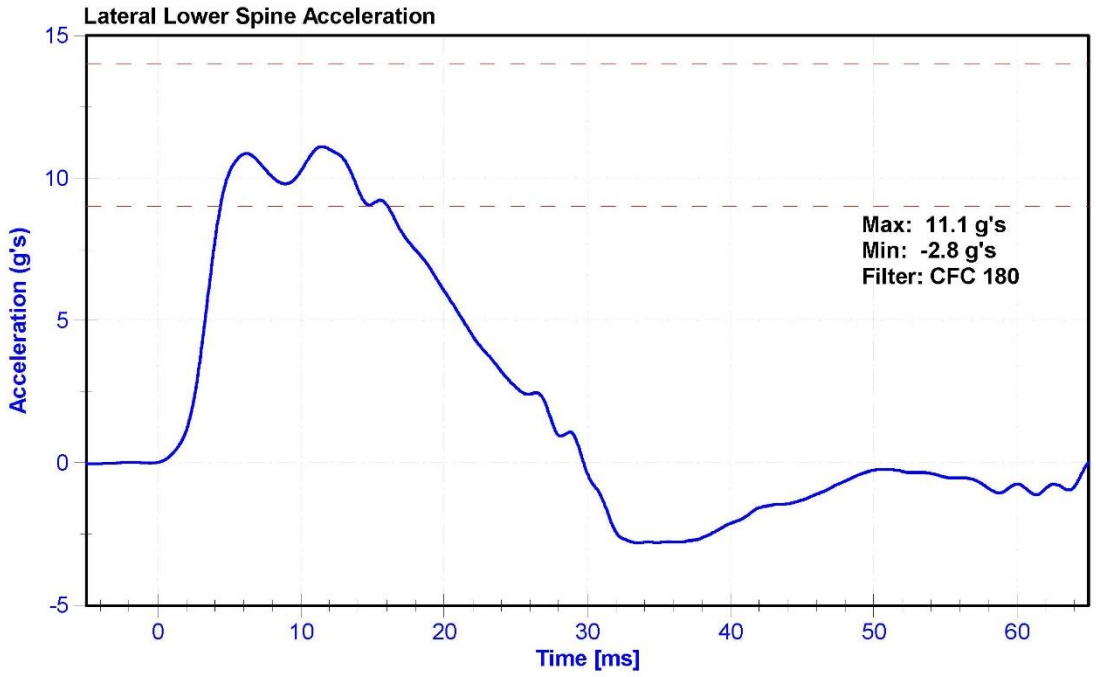
Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibratio Date	Calibration Due Date
Probe Accelerometer	ENDEVCO 7264CT	AC-P23155	1/13/2016	7/14/2016
Lower Spine Y Accelerometer	ENDEVCO 7264CT	AC-P51974	10/19/2015	4/18/2016
Upper Abdomen Rib Potentiometer	Servo 08CT1-3725	DS-1274GFE	10/19/2015	10/18/2016
Lower Abdomen Rib Potentiometer	Servo 08CT1-3745	DS-2316GFE	10/28/2015	10/27/2016




Upper Abdomen Rib Displacement
Displacement (mm)
Time [ms]
Max: 40.5 g's
Min: -0.0 g's
Filter: CFC 600


Lower Abdomen Rib Displacement
Displacement (mm)
Time [ms]
Max: 36.6 g's
Min: -0.0 g's
Filter: CFC 600


Lateral Lower Spine Acceleration
Acceleration (g's)
15
10
5
0
-5
0
10
20
30
40
50
60
Time [ms]
Max: 11.1 g's
Min: -2.8 g's
Filter: CFC 180

DENTON ATD, INC.
10317 U.S. Highway 250 North • Milan, OH 44846-9570
DENTON Tel (419) 625-5200 • Fax (419) 625-5335 • email: info@dentonatd.com • www.dentonatd.com

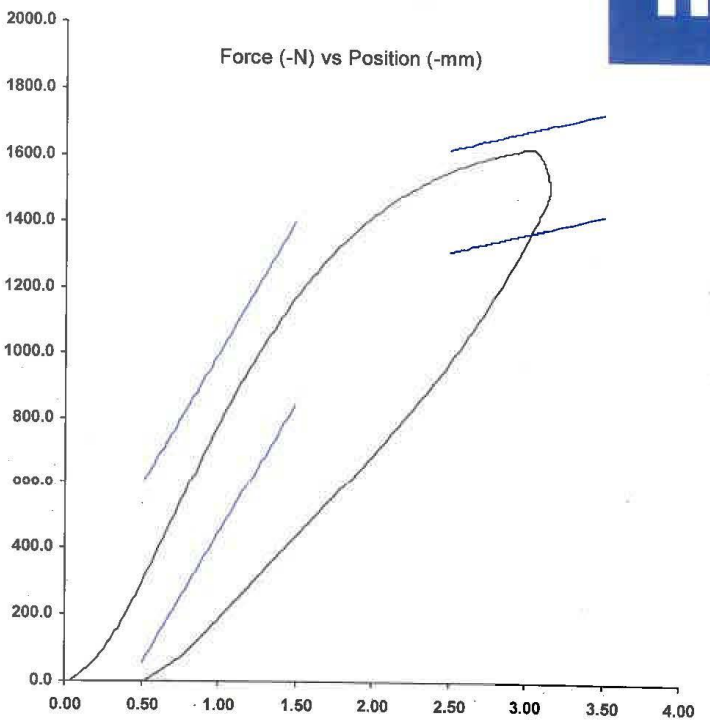
H

SID-IIs Pelvis Plug Quasi-static Certification

Specimen ID (Serial No.) 3179
Test Number 6501
Report Number 2404
Test Date and Time 7/20/2009 6:49:19 AM

	Test Results	Spec Min	Spec Max
Force @ 0.5 mm (N)	297.4	50.0	600.0
Force @ 1.5 mm (N)	1,178.9	850.0	1,400.0
Force @ 2.5 mm (N)	1,553.8	1,306.0	1,618.0
Force @ 3.0 mm (N)	1,621.8	1,361.0	1,673.0

Force (-N) vs Position (-mm)



Testing Machine SFM-20K
Load Cell S/N (318607A), Units (N) 5000

Crosshead Speed (-mm / min) or Rate 25
Extension or Position Measured by SFM-20K (02022512)

By : K. Ball Date : 8-3-09

Operator D. Resor D.R. Part Number 180-4450

Template No 107 20-Jul-09 Target Density (pcf) 4.66
Denton ATD, Inc.

DENTON ATD, INC.
10317 U.S. Highway 250 North • Milan, OH 44846-9570
DENTON Tel (419) 625 -5200 • Fax (419) 625 -5335 • email: info@dentonatd.com • www.dentonatd.com

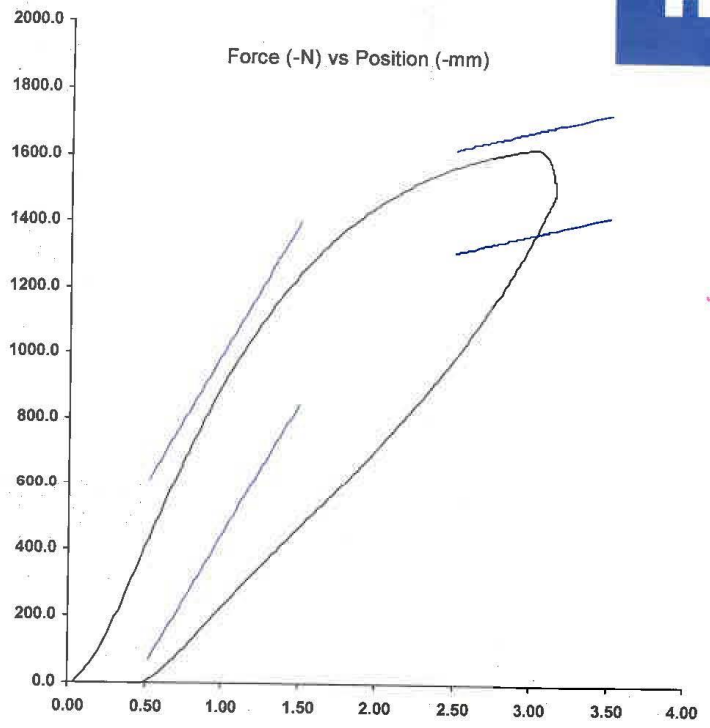
H

SID-IIs Pelvis Plug Quasi-static Certification

Specimen ID (Serial No.) 3180
Test Number 6502
Report Number 2404
Test Date and Time 7/20/2009 6:50:15 AM

	Test Results	Spec Min	Spec Max
Force @ 0.5 mm (N)	433.2	50.0	600.0
Force @ 1.5 mm (N)	1,247.0	850.0	1,400.0
Force @ 2.5 mm (N)	1,565.2	1,306.0	1,618.0
Force @ 3.0 mm (N)	1,622.9	1,361.0	1,673.0

Force (-N) vs Position (-mm)



Testing Machine SFM-20K
Load Cell S/N (318607A), Units (N) 5000

Crosshead Speed (-mm / min) or Rate 25
Extension or Position Measured by SFM-20K (02022512)

By : T. Ball Date : 8-3-09

Operator D. Resor D.R. Part Number 180-4450

Template No 107 20-Jul-09 Target Density (pcf) 4.66
Denton ATD, Inc.

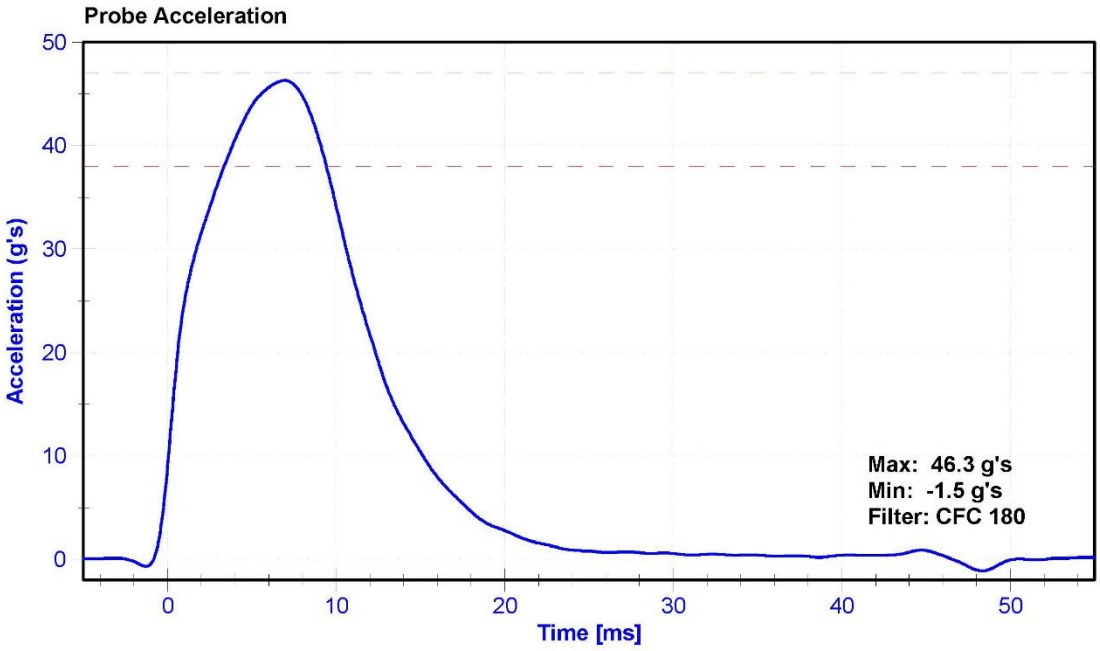
ATD Manufacturer	FTSS	Test Technician	M.Hartung
ATD Serial Number	303	Laboratory Supervisor	M. Goehle

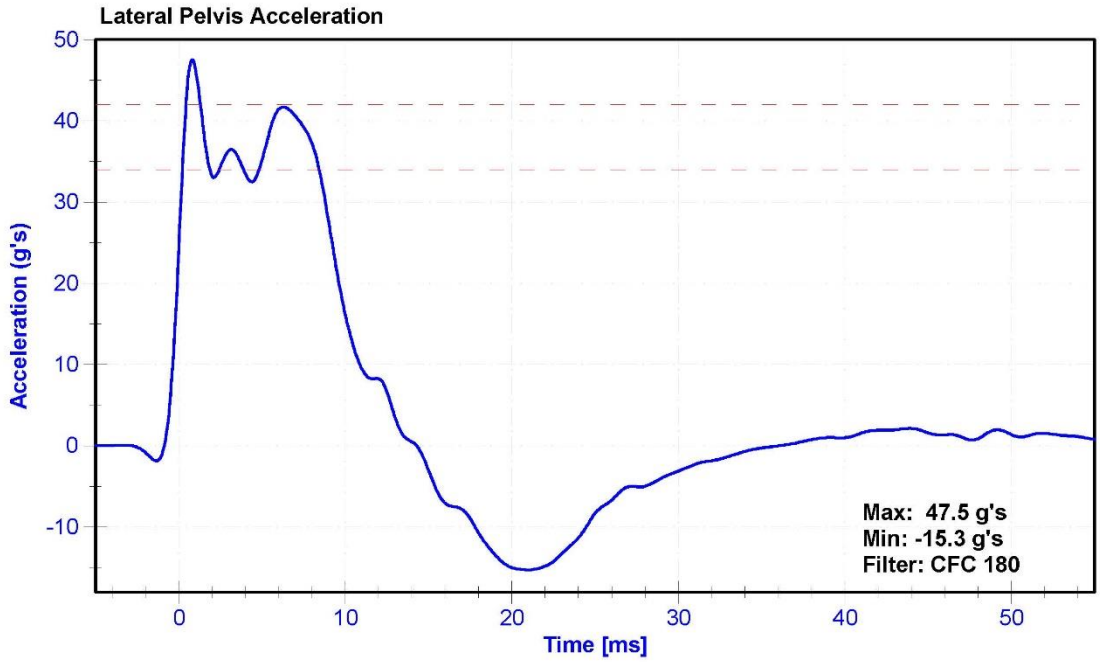
Results

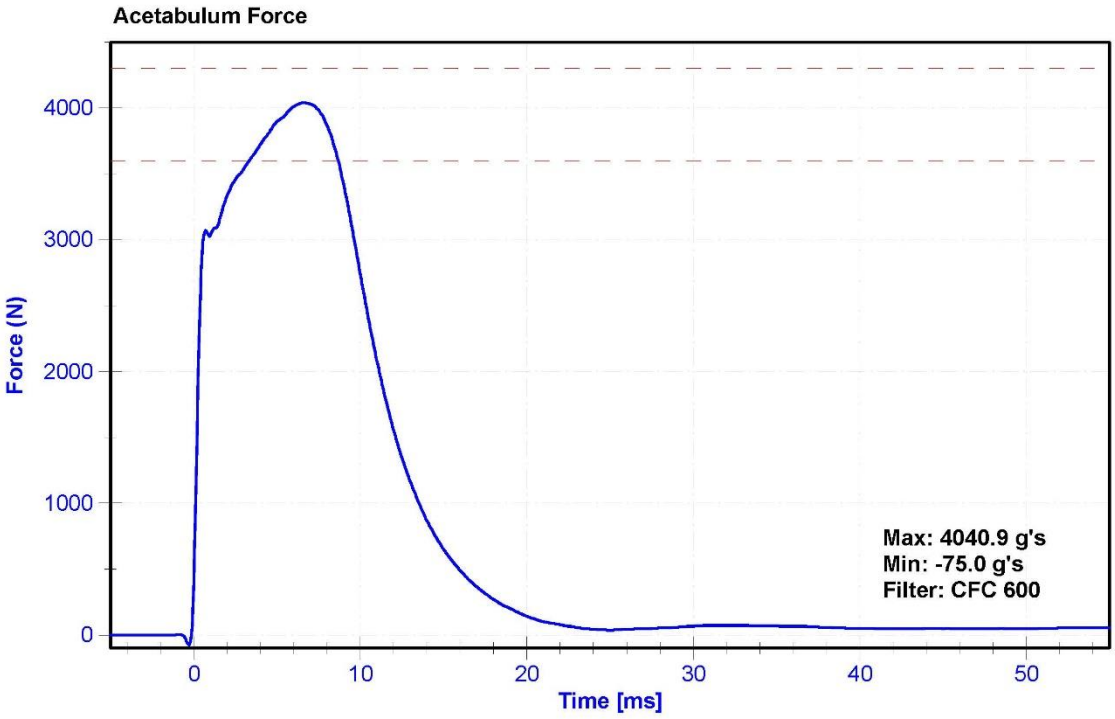
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	20.8	Pass
Humidity	10	70	%	24.3	Pass
Velocity	6.6	6.8	m/s	6.61	Pass
Probe Acceleration	38	47	g's	46.3	Pass
Lateral Pelvis Acceleration after 6ms	34	42	g's	41.7	Pass
Acetabulum Force	3600	4300	N	4040.9	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	ENDEVCO 7264CT	AC-P23155	1/13/2016	7/14/2016
Pelvis Y Accelerometer	ENDEVCO 7264	AC-P51259	10/19/2015	4/18/2016
Acetabulum Load Cell	Denton IF-520	LC-236Fy	6/29/2015	6/28/2016
Certification Plug	Humanetics	3179	7/20/2009	N/A
Crash Test Plug	Humanetics	3180	7/20/2009	N/A




Lateral Pelvis Acceleration
Acceleration (g's)
50
40
30
20
10
0
-10
0
10
20
30
40
50
Time [ms]
Max: 47.5 g's
Min: -15.3 g's
Filter: CFC 180


Acetabulum Force
Force (N)
4000
3000
2000
1000
0
0
10
20
30
40
50
Time [ms]
Max: 4040.9 g's
Min: -75.0 g's
Filter: CFC 600

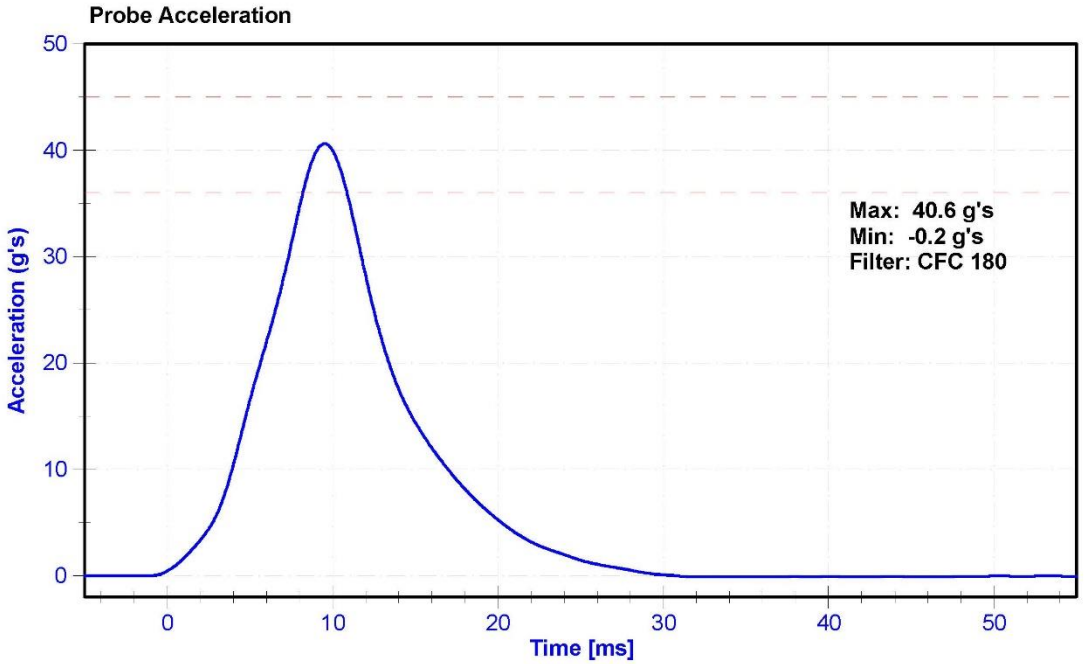
ATD Manufacturer	FTSS	Test Technician	M.Hartung
ATD Serial Number	303	Laboratory Supervisor	M.Goehle

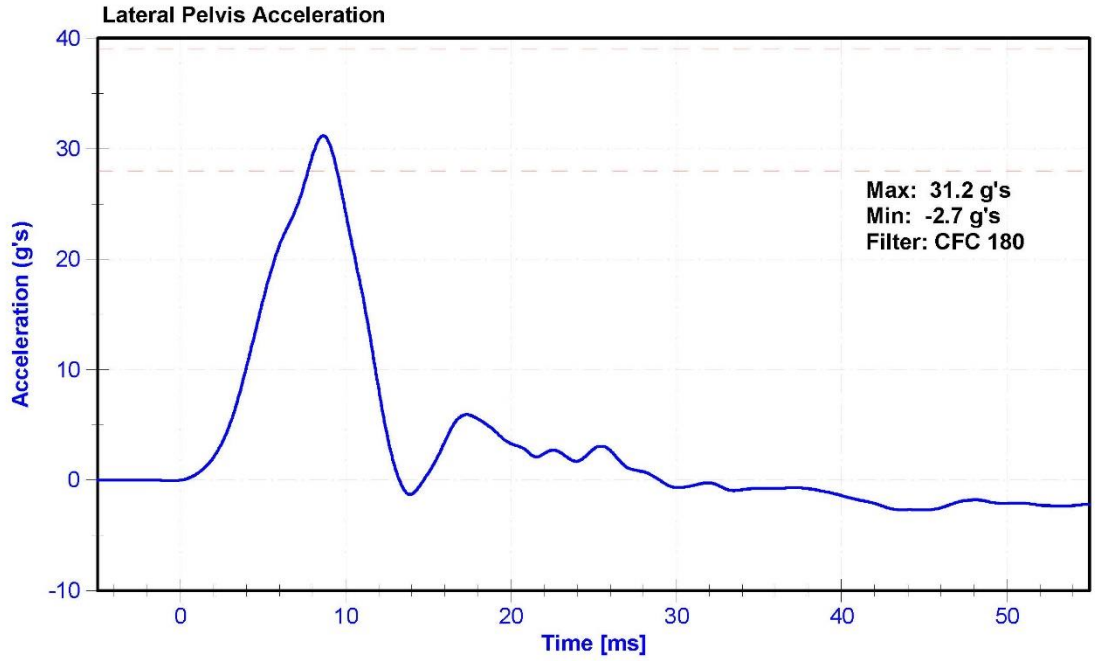
Results

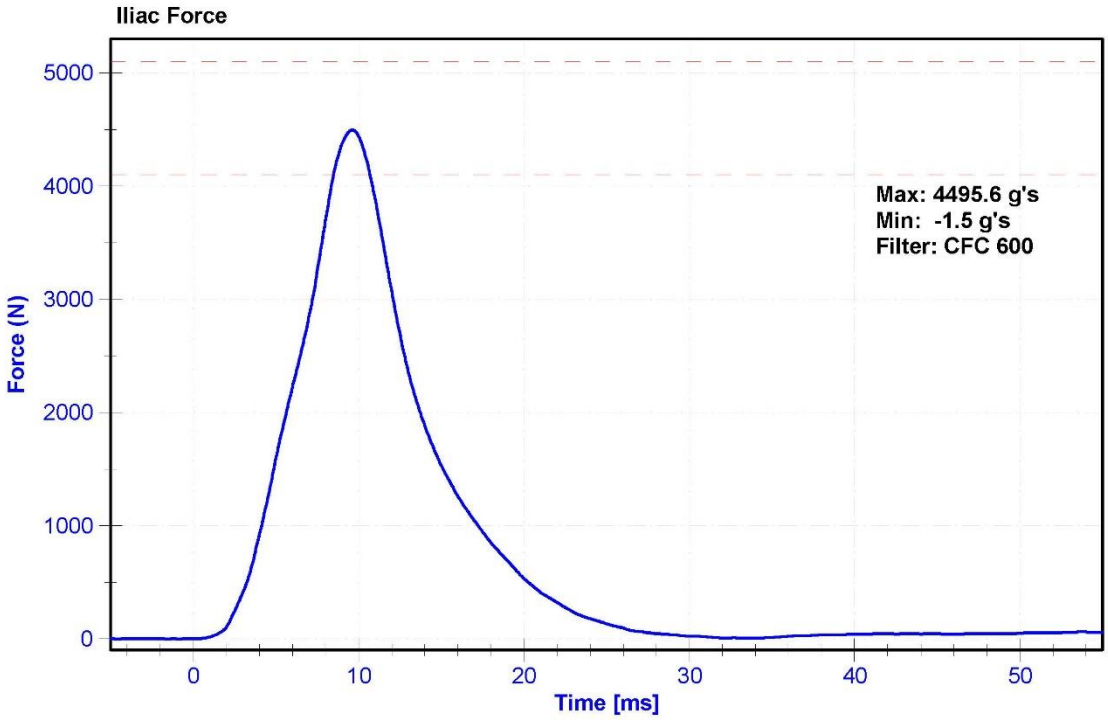
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.3	Pass
Humidity	10	70	%	23.8	Pass
Velocity	4.2	4.4	m/s	4.30	Pass
Probe Acceleration	36	45	g's	40.6	Pass
Lateral Pelvis Acceleration	28	39	g's	31.2	Pass
Iliac Force	4100	5100	N	4495.6	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	ENDEVCO 7264CT	AC-P23155	1/13/2016	7/14/2016
Pelvis Y Accelerometer	ENDEVCO 7264	AC-P51259	10/19/2015	4/18/2016
Iliac Load Cell	DENTON 3228J	LC-285Fy	7/21/2015	7/20/2016




Lateral Pelvis Acceleration
Acceleration (g's)
40
30
20
10
0
-10
0
10
20
30
40
50
Time [ms]
Max: 31.2 g's
Min: -2.7 g's
Filter: CFC 180


Iliac Force
Force (N)
5000
4000
3000
2000
1000
0
0
10
20
30
40
50
Time [ms]
Max: 4495.6 g's
Min: -1.5 g's
Filter: CFC 600

APPENDIX D

TEST EQUIPMENT AND INSTRUMENTATION CALIBRATION DATA

Table 1 – Dummy Instrumentation (SID-IIs)

				SID-IIs S/N: 303		
				Serial Number	Manufacturer	Calibration Date
Head Accelerometers			X	AC-P83420	ENDEVCO	10/16/2015
			Y	AC-P52040	ENDEVCO	10/14/2015
			Z	AC-P58737	ENDEVCO	10/14/2015
Head Accelerometers - Redundant			X	AC-P51668	ENDEVCO	10/14/2015
			Y	AC-P51327	ENDEVCO	10/14/2015
			Z	AC-P51695	ENDEVCO	10/14/2015
Displacement Potentiometer	Shoulder		Y			
	Thoracic Rib	Upper	Y	DS-1199GFE	SERVO	10/19/2015
		Middle	Y	DS-1246GFE	SERVO	10/19/2015
		Lower	Y	DS-1256GFE	SERVO	10/19/2015
	Abdominal Rib	Upper	Y	DS-1274GFE	SERVO	10/19/2015
		Lower	Y	DS-2316GFE	SERVO	10/28/2015
Lower Spine Accelerometers (T12)			X	AC-P51945	ENDEVCO	10/19/2015
			Y	AC-P51974	ENDEVCO	10/19/2015
			Z	AC-P51946	ENDEVCO	10/19/2015
Acetabulum Load Cell			Y	LC-236Fy	DENTON	6/29/2015
Lilac Wing Load Cell			Y	LC-285Fy	DENTON	7/21/2015
Pelvis Plug (Struck Side)				79584	HUMANETICS	11/5/2014
Pelvis Plug (Non-Struck Side)						

Table 2 – Vehicle Instrumentation

Vehicle Instrumentation		Serial Number	Manufacturer	Calibration Date
Vehicle Center of Gravity	X	AC-A156915	MSI 1201	10/8/2015
Vehicle Center of Gravity	Y	AC-A156941	MSI 1201	10/9/2015
Vehicle Center of Gravity	Z	AC-A112908	MSI 1201	10/9/2015
Left Floor Sill	Y	AC-A156925	MSI 1201	10/7/2015
A-Pillar Sill	Y	AC-A156912	MSI 1201	10/15/2015
A-Pillar Low	Y	AC-A156933	MSI 1201	10/8/2015
A-Pillar Mid	Y	AC-A156937	MSI 1201	10/9/2015
B-Pillar Sill	Y	AC-A156936	MSI 1201	10/15/2015
B-Pillar Low	Y	AC-A112915	MSI 1201	11/17/2015
B-Pillar Mid	Y	AC-A127663	MSI 1201	10/9/2015
Driver Seat	Y	AC-A120607	MSI 1201	10/20/2015
Engine Top	X	AC-A126803	MSI 1201	10/15/2015
Engine Top	Y	AC-A120604	MSI 1201	9/17/2015
Firewall	Y	AC-A126818	MSI 1201	10/14/2015
Right Roof	Y	AC-A156924	MSI 1201	10/19/2015
Right Floor Sill	Y	AC-A126821	MSI 1201	11/17/2015
Rear Floorpan	X	AC-A127660	MSI 1201	10/14/2015
Rear Floorpan	Y	AC-A127665	MSI 1201	10/7/2015

Table 3 – Pole Instrumentation

Pole Instrumentation	Serial Number	Manufacturer	Calibration Date
Load Cell 1	LC-18879	INTERFACE	6/5/2015
Load Cell 2	LC-18852	INTERFACE	6/5/2015
Load Cell 3	LC-46955	INTERFACE	6/5/2015
Load Cell 4	LC-18882	INTERFACE	6/5/2015
Load Cell 5	LC-18864	INTERFACE	6/5/2015
Load Cell 6	LC-18847	INTERFACE	6/5/2015
Load Cell 7	LC-62086	INTERFACE	6/5/2015
Load Cell 8	LC-46962	INTERFACE	6/5/2015